THE ASPEN INSTITUTE COMMUNICATIONS AND SOCIETY PROGRAM

THE FUTURE OF WORK 2.0

NAVIGATING THE TRANSITION TO NEW POSSIBILITIES

A REPORT OF THE 2018 ASPEN INSTITUTE ROUNDTABLE ON INSTITUTIONAL INNOVATION

DAVID GIBSON, RAPPORTEUR

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The Future of Work 2.0: Navigating the Transition to New Possibilities

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Rapporteur

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

Foreword

The Aspen Institute Roundtable on Institutional Innovation is a series of annual roundtables that convenes leaders from diverse perspectives to discuss challenges that organizations face with respect to institutional performance, particularly those occasioned by advances in technology. The aim for this series is to develop innovative insights and plans for action to improve organizational impact.

Today's leading businesses are dealing with a changing work environment that goes beyond artificial intelligence and robots. Instead, it encompasses the work machines and humans will do together. How can organizations create structures and strategies to bring new meaning to work and workers freed of the mundane activity currently in their jobs? And how can that combination lead to better results for the organization?

This report of the 2018 Roundtable, written by David Gibson, explores the Future of Work 2.0—focusing on how all stakeholders can realize the opportunities and possibilities of automation in the work landscape. It features a robust discussion on education, business structures, models of employment and leadership philosophies.

Gibson begins the report by focusing on the kind of learning that must take place to prepare employees for the workforce of the future. This includes the types of workspaces that organizations will have to build that will encourage a flexible approach to "inquiry-first thinking" and "solution-centered work" environments. Next, the report examines human capital and the investments made in workers' continuous learning. How do businesses deal with new challenges in job performance, recruitment and the retention of workers?

The report ends with a discussion on what leadership must look like in order to take advantage of the opportunities ahead. In order for leaders to maximize digital, network and data-intensive technologies of the future, workers at all levels will need to be empowered.

Acknowledgments

On behalf of the Aspen Institute Communications and Society Program, I want to thank the Deloitte Center for the Edge, specifically co-chairmen John Hagel and John Seely Brown, and Deloitte Consulting LLP and its lead, Jeff Schwartz, for sponsoring this Roundtable. Without their innovative thinking and leadership, this exchange of ideas would not be possible.

Additionally, the Program extends its gratitude to David Gibson, our rapporteur, for capturing the discussions and translating them into an engaging, thoughtful report. As is typical for our roundtables, this report is the rapporteur's distillation of the dialogue. It does not necessarily reflect the opinion of each participant at the meeting, or their employers.

Thanks, also, to Dominique Harrison, Senior Project Manager and Sarah Eppehimer, Project Director of the Communications and Society Program, for their work on the conference and bringing this report to fruition. Finally, none of the content in this report would be possible without the insights and expertise of the Roundtable participants. We thank them for their valuable contributions to this project.

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March 2019

The Future of Work 2.0: Navigating the Transition to New Possibilities

David Gibson
Rapporteur

The Future of Work 2.0: Navigating the Transition to New Possibilities

David Gibson

Introduction

We are living in the glorious future, in the steel-and-electric epoch predicted by futurists and fictionists, an age shaped by the forces of computerization and robotics, enlightenment and diversity. By now, certainly, these forces should be making a profound difference in the way that individuals spend their time and make their livelihoods, and big changes in the organizations that employ them. And they are—but not in the way we may have imagined just a few years ago.

Rather than a white-collar utopia, society finds itself living in a "whitewater world." This term, coined by John Seely Brown and Ann Pendleton-Jullian, describes a reality that is rapidly changing, hyper-connected and radically contingent. To navigate this world, corporations, talent officers and workers themselves must (according to Seely Brown) read the currents and disturbances around them, interpret the flows for what they reveal about what lies beneath the surface, and leverage those disturbances and flows for amplified action.

At the 2018 Roundtable on Institutional Innovation, participants sought to identify the currents that will shape the future of work. This includes approaches to creating opportunities for continuous learning and supporting workers in the development of new skills, knowledge and capabilities. Perhaps most importantly in this whitewater world, participants searched for improvements that can be made to the organizations we influence—with the goal of building ships less like an ocean liner, and more agile like a kayak.

The following report begins with a survey of the current trends in the automation of work, and an exploration of the challenges and opportunities that are on the horizon. Then, the report proposes the way forward derived from in-depth discussions—conversations in which the group humbly attempts to reinvent:

- Education
- Business structures
- Models of employment
- Leadership philosophies

The ability to shape the Future of Work 2.0 rests upon society's willingness to create a wholly new work environment, one that can harness the potential of a new kind of worker.

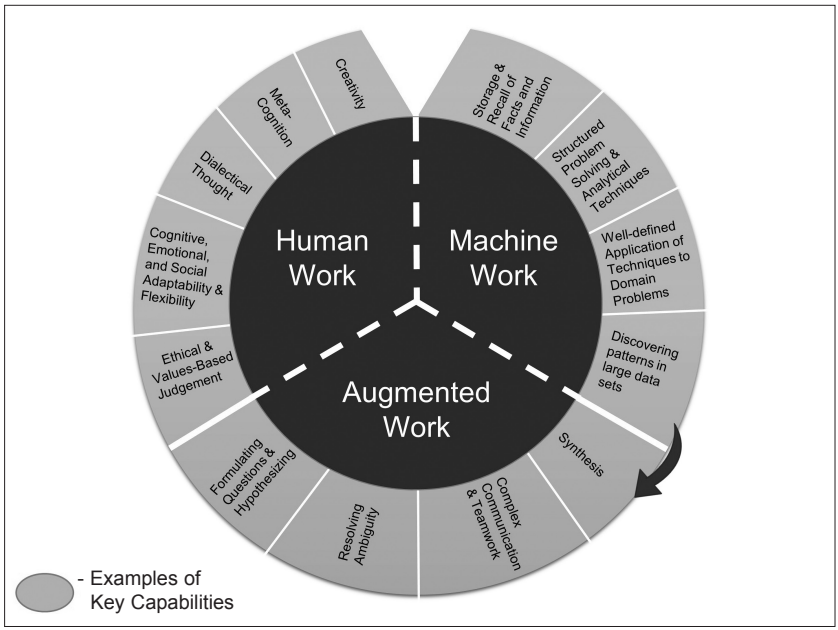
AI, Robotics and the Future of Work

There are things that computers are very good at, so good that they are known as "machine work." This is structured, well-defined work that computers can tackle repetitively, without human fallibility. From weaving to number crunching, there are tasks at which humans simply cannot compete with mechanical and computational solutions. Algorithms can be applied to massive data sets to come up with desired outputs, and as more and better data points are absorbed into the calculations, more exact outputs are created. Programs that take advantage of machine learning (often conflated with Artificial Intelligence, or AI) are able to refine their own algorithms and discover patterns in data caches too large for any human to comprehend. Humans have ceded this kind of work to machines, hanging on only in the margins where no one has yet bothered to write an appropriate algorithm. Indeed, some jobs that were once thought to require long human experience—think concierge services, drafting artists, credit authorizers—have been shown to be better performed by cannily written algorithms.

Humans, however, still have their work domain. These are activities that require cognitive, social and emotional flexibility and agility, most obviously the interpersonal work that requires empathy, understanding, persuasion and care-giving. These activities are also creative endeavors, didactic and pedagogical pursuits. They are also jobs that require a degree of metacognition—the idea that humans may reflect on their own thinking process, which requires a model of consciousness that machines have not yet achieved. For computers to engage in this type of work would require true (general) artificial intelligence, something that researchers have yet to create. Human work is safe, for now.

However, there is a large category of work that can be called augmented work. At its most basic, this refers to the pairing of a human and a machine to complete a task. Maryam Alavi, Dean of the Scheller College of Business at Georgia Institute of Technology, describes this as teaming machines and human beings to do work with the goal of elevating performance to accomplish tasks that would be hard, or not possible to do by machine or human alone (see Figure 1). A category of work humans once did can now be done more accurately, more quickly and at massive scale by machines. In augmented work, an algorithm may be able to analyze patterns in big data, but it still takes human cognition to make sense of the analysis, to place it in context and to communicate the results in a way that other humans can understand and act upon it.

Figure 1. Future of Work



Source: Maryam Alavi, Georgia Institute of Technology, August 2018

Humans are unlikely to take back many tasks that have been automated. The goal, then, is to design work and develop a human workforce that can partner with machines to perform complex and unstructured tasks. To achieve this will require humans that are educated in a particular way.

Educating the Workforce of the Future

Most educators look at learning as a mental process that is incremental. It takes place over time as a sequential process of knowledge acquisition, from basic to advanced knowledge (see the revised Bloom taxonomy displayed in Figure 2). The future of work will require enhanced levels of higher order thinking capabilities on the part of humans; however, lower level basic learning must come first. Some argument may be made that "street smarts" escape this incremental necessity. However, it may be argued that this is a form of high-level thinking built on basic lessons provided by asphalt rather than algebra.

Learning basics begin with exposure to information with proper perception and attention paid to it. Then, comes the ability to recall facts. This represents the lowest level of learning. One step up comes interpretation, or the creation of mental models based on information received. Next, is application—or the ability to use and implement acquired knowledge in new situations. These three steps constitute lower-level learning, and for many years these were the three skills that society expected educated humans to have. The modern (U.S.) K-12 educational system—which features sets of problems to be solved in pursuit of predefined answers—is largely designed to achieve competency in these areas (and to teach children how to follow directions, a skill of limited usefulness beyond a modest skill level). Many students never advance beyond the three most basic competencies.

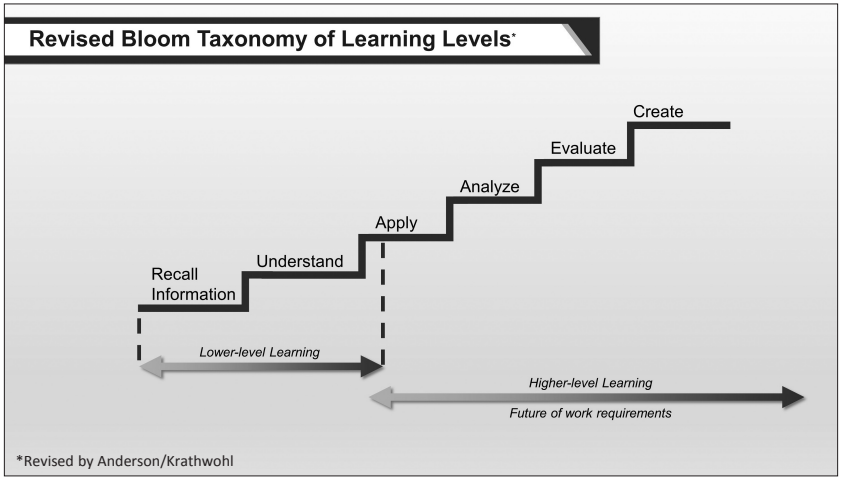
…to create a workforce that cannot be replaced by machines [requires]…cognitive flexibility.

At the next step is the level of complex analysis (i.e., analysis in various and different contexts), which includes competencies that are not easily replicable by machines. The next level calls for skills in evaluation that require the application of judgement and lead to the ability to find solutions for ill-defined problems. The next and highest step is creativity, which allows a human to realize new ideas and concepts, new connections, and new models and techniques.

In short, to create a workforce that cannot be replaced by machines—and, more ambitiously, can be partnered with machines to find and

solve highly complex problems—the workforce must be competent and comfortable with higher-level learning and thinking. This highest level, the multiplier of all the others, is cognitive flexibility. In Dr. Alavi's words, "Cognitive flexibility is the ability to do multiple things and [be] able to learn fast." The question is, how to cultivate some competency in these higher levels of learning across diverse levels of the workforce. Everyone in the workforce will not be solving massive problems, but increasingly they will be called upon to yield machine work to the machines and use higher-level competencies to add value, think and move quickly among different concepts and contexts and [be] able to learn fast."

Figure 2. Revised Bloom Taxonomy of Learning Levels



Source: Anderson, L.W. & Krathwohl, D.R. (Eds.) (2001). A taxonomy for Learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives. New York: Addison Wesley Longman.

The University Model

Traditionally, corporations have depended on universities to provide workers that are competent in higher-level thinking. The approaches provided by colleges tend to be disciplinary, with students following one path in the study of a particular subject matter (e.g. history or architecture). More recently—in the service of developing a creative skills hierarchy—schools are seeing an increase in multidisciplinary,

interdisciplinary and transdisciplinary approaches to learning and education. A multidisciplinary approach involves studying and learning more than one subject matter. Examples include dual degrees in business and engineering, or business and law. In this model, a student stays in school longer and fulfills the requirements of more than one program and typically receives more than one degree. The idea is to develop capabilities to analyze and solve complex problems more effectively by applying more than one disciplinary viewpoint, opening up new courses of action and new creative insight.

Interdisciplinary learning combines the relevant and interrelated aspects of different disciplines in a single program of study. Georgia Tech has developed an interdisciplinary Master of Science (MS) in analytics degree. This degree brings together various analytical concepts, tools and techniques (from engineering and computer science) and core management courses to develop capabilities for data- and evidence-based business decision-making and problem-solving.

True transformation will require a new and more inclusive culture of learning—one called "continuous learning."

There is yet another approach, one that may be truly groundbreaking, as it challenges traditional pedagogy. It is known as "transdisciplinary learning," and it echoes the realities of the post-educational world. The transdisciplinary approach is formed around a real world problem rather than core concepts or methods of a given discipline. This is inquiry-based learning, and it begins with defining the problem and searching for relevant knowledge. From there, learners back into disciplines that can provide the know-how and capabilities to solve the problem. It is clear that these are the skills that modern organizations want in their higher-level employees, where the aim is to discover something that has yet to emerge, where structures do not yet exist. For example, sustainability problems require effective and comprehensive solutions which call for transdisciplinary knowledge of social, economic, environmental and engineering aspects.

Peter Fasolo, Executive Vice President and Chief Human Resources officer at Johnson & Johnson, notes that these intersections may happen outside of the regular degree programs and curricula, which tend to be fixed. In traditional university programs, students accumulate skills in service of a degree that will convey their ability to figure out problems to be faced later. This leaves transdisciplinary learning to the domain of non-degree executive development programs. Thus, corporations can explore opportunities like, "I am in the process of X, and I need to digitize this part of the organization," and then bring in the disciplinary perspective and new knowledge needed from wherever it resides. Teaching in these types of programs can be done by faculty from different colleges and executives from many companies.

This highest realm of learning, currently, is one that exists for the benefit of existing corporations, mostly within an "executive education program." If the goal is to educate an entire workforce—to truly transform the way we work, and think about work—the focus cannot only be on the top tier of workers. True transformation will require a new and more inclusive culture of learning—one called "continuous learning."

A New Culture of Learning

The half-life of skills is growing ever shorter, so learning has to be a continuous project. "Continuous learning" requires higher-level thinking skills, applied by learners in a transdisciplinary way. Learners will need to be cognitively flexible and learn fast, and in order to learn fast, they will need to know a lot already. But that does not mean just executive-level employees qualify—a whole host of workers have deep knowledge within their fields of expertise, as well as the drive to learn more. Among the skills that lifetime learning will require is the ability to recognize a solution in one domain and apply it to another—a skill that can be developed. Equally important is the concept of "unlearning"—the ability to selectively forget the tried-and-true in the service of finding a fresh entry point into a problem.

The half-life of skills is growing ever shorter, so learning has to be a continuous project.

Jeff Schwartz, Principal of Deloitte Consulting (with inspiration from John Seely Brown), has suggested a model similar to DevOps, the combination of development, information technology operations and testing within the same unit. "In the same way that in technology we've said we're going to take design, development, testing and operations and integrate it into a DevOps model, can we make a model in which learning is 'Dev' and 'Ops' is work?"

Learning will become a by-product of doing the work. This will require the redesign of the work itself, and ultimately, likely the organizations and institutions where work is done.

Workers will never have enough time to leave work, come to school, learn a few things, and then go back to work, so the system must be one in which working and learning will be increasingly intertwined—consistent, rather than episodic. Learning will become a by-product of doing the work. This will require the redesign of the work itself, and ultimately, likely the organizations and institutions where work is done.

Inclusiveness and Continuous Learning

One challenge to the continuous learning model is that it leaves a big slice of the workforce out in the cold. Maureen Conway, Executive Director of the Economic Opportunities Program at the Aspen Institute, notes that one in four working adults who work full-time do not make enough to lift a small family out of poverty. These people are adults, with adult responsibilities and adult expenses. It is difficult to get them to a level of economic stability that will give them time to learn, particularly if learning is a separate endeavor from the work. If work and learning are intertwined, this becomes less of a problem. Time, however, is not the only issue. The psychological and mental "space" to be open to learning and able to learn is important as well. Being under duress, stressed and threatened, is prohibitive of continuous learning, further widening the income and opportunity gaps.

Turning to populations that are entering or looking to re-enter the workforce, studies find that there are systemic challenges beyond just the lack of time for learning. Most notably, modern education in the U.S. is financed through loans. Because many of those loans are offered based on credit history, tens of millions of Americans cannot get access to them in the first place. Those that are able to take out loans to finance learning often find that this debt becomes debilitating upon graduation and paying it off requires them to work on a continual basis—at the expense of lifetime learning.

Moreover, incentives within higher education are rarely to students' advantage. Colleges rely on a "butts-in-seats" business model, rewarded for putting students in classes, not for the things those students eventually achieve. Furthermore, universities—and indeed, most of society—actively promote the idea that a four-year degree is a goal worth striving for, and that this type of education should be available to everyone. Simultaneously, selectivity in admissions at elite colleges correlates with high rankings in most surveys, explicitly rewarding exclusion. All of this sends confounding messages of "everyone can go to college," followed by "maybe not a good one," and "probably not at a price you can afford." Employers perpetuate these ideas by writing job descriptions that require degrees when an academic skill set may not actually be required to succeed in the job.

Starting college is a risk with few safety nets, and even successful students may struggle with debt and unemployment after they receive their degrees. But a more efficient approach—one in which students dip into the university system to gain specific skills but not a degree—saddles them with debt with none of the social and economic imprimatur that a degree conveys. Obviously, the economic reality of higher education suppresses participation by those from lower socioeconomic strata, depriving our economy of a vast pool of talent.

Until our system of higher education corrects these inequities, it is critical to develop other paths to higher-level learning. The classic model of higher education may not be the best option for many—perhaps most—people. Instead, a truly holistic system would incorporate university degrees and certifications, as well as apprenticeships and guild models. Beyond these models for education (and the augmenting of competencies as required skillsets change), workers should have access to opportunities for development through corporations which make a commitment to continuous, on the job learning.

Perhaps because of the place college holds in the popular imagination, the idea of apprenticeships gets short shrift. Colorado Governor John Hickenlooper spoke about the apprenticeship program for high school students he has championed in the state. "It's a question of branding, and how we talk about it. One way we do not talk about it is as a substitute for college. It's a pathway that allows you a choice of going to college or not going to college. You get to choose."

The state's program strives for inclusiveness, and its messaging reaches kids who are "a little different, who are willing to go out and do something like become an apprentice." But after the initial contact is made, there is follow-up to show students—and their parents—the advantages. "We put a chart up and show, all right, if you go to Colorado State University, you're going to spend $25,000 a year… and here's how much you're in the red. If you do an apprenticeship, here's how much you're in the black. At the end—and we do this over the course of ten years for two imaginary students on a parallel path—it's a big delta. It's $175,000 or $200,000 difference. And you still have the same choices."

"The only true poverty campaign, I think, is education and training, and we've been saying too much education, maybe not enough training."
– Governor John Hickenlooper

Employment Projections for 2016-26 from the Bureau of Labor Statistics note that, "Of the 30 fastest growing detailed occupations, 18 typically require some level of postsecondary education for entry." Viewed from the other side of the coin, 12 of those 30 do not require college-level coursework, much less a degree. But, they will require skills. As Governor Hickenlooper notes, "The only true poverty campaign, I think, is education and training, and we've been saying too much education, maybe not enough training."

Building the New Workspace

Beyond education, the physical work environment significantly contributes to how workers learn and apply their skills effectively. All organizations have workspaces built into them. For many, this design is an

afterthought, an accident of an office space built on top of an organizational chart. The workplace of the future needs to be more intentional.

"How," asks John Seely Brown of Deloitte's Center for the Edge, "are we going to craft spaces for things to happen, whether it be organizational spaces, physical spaces, cognitive spaces or emotional spaces?" If the two parts of the future of organizations are learning and working, then the question is how to design a context that is supportive of both?

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In higher learning processes, transdisciplinary and continuous, workers solve new problems every day. Teams vary according to the problem. This is not an arrangement that can be solved with a revolutionary office plan. It is going to be solved with a revolutionary way of thinking.

Inquiry-First Architecture and Solution-Centered Workspaces

Today, the best organizations are set up to learn from exceptions. No case is ever the same, and problems are too complex to apply standard approaches. Playing "best practices" is, at best, playing the odds. Organizations may arrive at an acceptable answer, but not at a great one, and certainly not an inventive one. Improvisation will be necessary—but that does not mean making it up as they go along.

In the future of work, organizations will not be starting with a process, they will be starting with a question. "Inquiry-first thinking" lets an organization start with a problem that needs to be solved, and then work back to discover the kind of knowledge and process that will find the solution. This is a creative process, a shining example of higher order learning, and it is not something that machines may ever master. The challenge comes in creating a work environment that supports that framing. It requires systems, it requires new physical, organizational and social structures. These structures can be flexible—and indeed must be.

Given today's pace of change, workers every day face the unexpected. Processes no longer work, and the workers that get ahead are the ones

that are able to interpret exceptions in an almost subconscious way. This is the essence of transdisciplinary learning. This approach requires an embrace of ambiguity, and the patience to wait for results. Inquiry-led learning is not the most time-efficient way to tackle a problem, even if it is the most effective.

In the future of work, organizations will not be starting with a process, they will be starting with a question.

John Hagel, Co-Chairman of Deloitte's Center for the Edge, expressed frustration with some of the companies that he talks to. "When I talk to executives about learning, almost inevitably the conversation quickly gets to sharing existing knowledge," he says. They talk about courses and learning on the job, making micro-courses available in the work environment, about finding a lecture or lesson that will bring employees up to speed. Hagel suggests that the most valuable learning goal is the creation of new knowledge. Because we live in a business world where there are more and more exceptions and less and less routine, the companies and the institutions that are going to thrive are those that figure out how to help people create new knowledge continually. This is about more than listening to lectures and being able to do a Google search for a question.

At Amazon, according to Senior Vice President of Human Resources Beth Galetti, the process begins by identifying the problem, and then working backwards. "The learning comes when there's a lot of specificity in the problem and there's clarity in what success would look like," she says. Broad problems are challenging because too many people get involved, and a lot of time is wasted, and there is typically a loss of focus. Giving people very specific problems allows them to experiment quickly to test the outcomes.

That does not mean that big problems cannot be solved. Peter Fasolo of Johnson & Johnson, speaks of the company's "process for creating process." It begins with a big question; chief scientific officer puts a figurative bull's eye out on the table that says, "Lung cancer, HIV

vaccines—how do we solve this?" That question creates an ecosystem around itself and gathers up all of the knowledge that sits inside of Johnson & Johnson. Importantly, the engaged workers are told to be agnostic to which department—or even outside organizations—the solution comes from.

…the most valuable learning goal is the creation of new knowledge. *– John Hagel*

Michael Arena, Chief Talent Officer of General Motors, has done a lot of thinking about this as well. "Once you've discovered that we've got to bring something new into the world, all of a sudden I want a different set of social arrangements. I want lots of people who really are great engineers in the room to iterate and experiment and bring it to life. So for me, these workscapes change depending on the intent and the challenge at hand." There might be times where a company will want to lock into a system in order to scale quickly and distribute value across an organization, but the initial architecture must begin with the inquiry.

Big problems, notes Steven Spear, Principal of HVE, LLC and Senior Lecturer at Massachusetts Institute of Technology (MIT), are solved with little steps. A quintessential example is Neil Armstrong stepping onto the moon and calling it a "giant leap." Spears continues:

> If you really want to dig into it, there was never a giant leap, it was just millions of small steps. Neil Armstrong was not on the first Apollo mission, he was on the eleventh, and Apollo was not the first space program, it was the third, behind Mercury and Gemini. And the big accomplishment of Mercury was getting nowhere near the moon; they just sent someone up and returned him safely to the earth from very, very low altitude. But in solving that one problem, it gave a stable platform onto which the next problem could be revealed and then solved, and that allowed for the revelation of the next one and the next one.

Hierarchical structures must also change in solution-centered workplaces. In today's world, notes John Seely Brown, "All of us are always newbies." Each of us has to be willing to pick up new skills all the time.

That can mean an upending of the traditional mentorship role, with well-established employees learning from much younger coworkers on some subjects, and more traditional mentorship happening on others. "Both groups have tremendous things to tell the other," he says. "Wisdom can go both ways."

…creating new knowledge is mainly done by human beings experimenting and failing. "If failure is seen as something bad, you won't create." – *Guenter Pecht*

Another org-chart issue concerns the direction that information can be shared. Esther Dyson, Executive Founder of Wellville, points out that all workscapes need to have a way to share information not just between employees, but with management. The exceptions that lead to insights are typically going to happen lower down in the organization, where workers are dealing with more specific cases. If they are left to solving problems themselves but not sharing that knowledge up the chain, then the organization as a whole will not learn much at all.

To gain that knowledge in the first place, companies must give employees permission to gain knowledge. Or, put more directly, they must give the permission to fail. At SAP, according to Global Vice President for the Future of Work Guenter Pecht, it is accepted that creating new knowledge is mainly done by human beings experimenting and failing. "If failure is seen as something bad," he says, "you won't create."

The Problems of Existing Corporate Culture

The list of things that are problematic about modern corporate structure is long. Beginning at the top, shareholders demand high quarterly returns rather than long-term company health. Then comes the Chief Executive Officers and Board Directors who are also often incentivized by share price. Whether it is in service of higher stock prices or simply a relic of industrial culture, however, there is one major problem baked into most corporate structures that will create havoc: the idea of scalable efficiency.

Scalable efficiency—the idea of reducing costs through standardizing outputs and processes and streamlining routine tasks— works, and has worked for centuries, to produce large numbers of standardized products/services. But it works incrementally, and the more costs are cut, the harder the next increment is to achieve. The models needed to harness for the future—creating cultures in which workers embrace solving problems and identifying opportunities—are about making exponential gains rather than incremental ones. In addition, producing large quantities of standardized products is less desirable as customer needs and expectations become more specific to their own context and also change more rapidly.

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Hagel's research through Deloitte has him talking with CEO's around the world. "In the privacy of their offices," he says, "when we talk about future of work, there are two questions—'How quickly can I automate? How many jobs can I eliminate?' It's all about cost reduction." While noting that there are some exceptions, he says, "Particularly for the large traditional companies, the way work is defined today is a set of routine tasks tightly specified. You have a process manual that goes into infinite detail about each task and how it needs to be done. It needs to be done the same way everywhere, standardized and tightly integrated. Well, frankly, if that's what work is, machines do that so much better than we human beings can."

Further complicating matters, almost every department of almost every organization is still captured by an annual budgeting cycle, no matter the long-term goals. "By the time they've seeded [an idea] and got it out there and it's time to spend really big bucks to actually build it, most of it dies," says William Coleman of the Carlyle Group. He notes that it is much easier for large companies, especially in the tech sector, to grow by acquisition than by developing new, groundbreaking products.

In any given organization, the drive for scalable efficiency will crush the drive for innovation. Corporations act like living beings, in that any novel structure is perceived as a threat. Workers in the system who offer advice based on old models—even if they are trying to helpful—end up acting like antibodies, shutting down the creative process.

New Models for New Thinking

There are many different models for how one might redesign the workplace for exponential learning. Most of them, perhaps unsurprisingly, are built around avoidance of "the core"—the place where existing corporate culture is strongest. The core is an entity motivated by self-preservation. It is also where power resides and where grand decisions are made. It is risk-averse, preferring the stability of incremental gains to the risks of exponential ones. Exponential learning, then, must happen on the edges, in more agile groups.

There must be bridges back to the core. These bridges are the most important part of the model. They must protect the edge groups from the antibodies of the core, but at the same time, must be able to communicate novel learning back to the core for the benefit of the organization. These bridges are not structures, they are people. The role they fill will be one of the most important in the future of work.

According to Michael Arena, Chief Talent Officer at General Motors, these bridge people will have to be more coaches than leaders. They will have to be sense makers. "They connect all the different power points, but they are translators, and they protect those agile pockets." They will be people who have earned the highest firm equity, and who are powerful enough to be listened to, and comfortable enough to sacrifice their authority—or risk becoming just another "helper."

The catch-22 is obvious here. The core must cede power to bridge workers, in effect willing itself to be subverted. Furthermore, in pursuit of creating agile teams that rebuild processes in the name of innovation, a company must create a system for developing teams. Ad-hoc teams are wonderful, if they have been granted time and permission to form, though their very ad-hoc nature may create issues of trust.

Today, when a company creates special-purpose teams, they are mostly pulled from existing talent. Someone in the core senses a problem and

immediately makes a call to "put our best people on it." But creating edge teams from workers who are trusted by the core almost guarantees that some of the core's antibodies will start an attack. Michael Arena instead suggests the need to start an era of "teams over talent."

This model acknowledges that the "best people" are in such demand that they may not stay with an organization for long. So instead of forming ad-hoc teams, organizations might instead start and empower team constructs, viewing teams rather than individuals as the basic unit of innovation. Teams maintain their agility and speed, but will not be as vulnerable to the loss of individual human capital. In other words, if one person quits, all is not lost.

Taking it one step further, companies can begin to view the organization-worker model as one of access rather than ownership. In this model, a corporation acts as more of talent broker than a place with employees on lifetime lock-down. Different teams can be brought in to solve different problems.

In many ways, this circles back to the issue of technology. We view machines as talent for the things they are particularly good at, and do not think for a moment about turning them on and off as needed. For human workers, we do not have a system that enables this without adding chaos into actual human lives. Today, corporations unitize on-balance sheet and off-balance sheet talent, people working as full- and part-time employees, and contractors, gig workers and crowd workers, and it is a hard system to optimize, especially for workers.

Pointedly, the solution is not the expansion of the gig economy; a society in which everyone works for themselves cannot create an advanced economy, which requires cooperation. But it is possible that smaller, scalable, employee-owned companies can fill the role of these edge teams. This is something like the Hollywood model, in which specialized production teams move from studio to studio on a project basis.

Alexi Robichaux, Co-founder and Chief Executive Officer of BetterUp, takes that model one step further, suggesting that we may be underestimating the creative potential of technology. "The corporation came about in the 17th century because it was what technology enabled in terms of organizing human beings in a unified structure to gain the greatest leverage. But if we're thinking about technology today, it's hard for me not to think that there may be a view of the world where compa-

nies are just brands and sets of values built around how they treat their customer and how they treat their employee."

…the very laws of economics that allowed large corporations to thrive might tear them down.

Through the use of technology, organizations may be able to create working teams that subscribe to a company for some undefined time. "We'd see radical efficiency, but we'd also see the increase of individual agency and choice, because if I don't like how Brand X treats me, I don't like how they treat my customer, me and my team can defect and go over to Brand B." It is a dream of a radically empowered employee, which could be a nightmare to some corporations. Considering the directions in which technology is advancing, and with 4 billion people working on a hyper-connected planet, the very laws of economics that allowed large corporations to thrive might tear them down.

Maximizing Human Capital

The workscape of the future will prioritize the optimization of return on human capital and the investment made in workers' continuous learning. But, notes Karan Chopra, Executive Vice President and Co-Founder of Opportunity@Work, "Human capital does not show up on the balance sheet." Organizations cannot optimize return on human capital if the only way they keep track of it is with a cost item on a profit and loss sheet (P&L). The current limited view, when coupled with a scalable efficiency mindset, leads to fear in the workplace, because it is obvious to workers from the CEO on down that reducing payroll will boost profits. Increasingly, technology gives companies the means to do just that. To find the true value of human capital, perhaps organizations first need to find out what those humans value.

Employee Autonomy and Empowerment

Mukti Khaire, an organizational sociologist from Cornell Tech, notes a peculiar example of the Hawthorne Effect—the tendency of humans that are the subject of an experiment to change their behavior in response to being observed. In one management study, workers on a

factory floor complained that the lights were too dim. They were brightened accordingly, and productivity went up. Sometime later, workers complained that the bright lights created glare, so the factory managers lowered the lights—and productivity went up again. Being able to see, it seems, is not as important as knowing you are being heard.

"Human capital does not show up on the balance sheet." *– Karan Chopra*

Maureen Conway notes that companies with satisfied employees often cross-train them "so that people on the front lines interacting with customers have judgment. Being able to solve the problem of the person in front of you is a much happier job than saying, 'Oh, I have to go find my manager and see if I'm allowed to do this.'" Going deeper, it is about how transparent a company can be with its employees. Conway says it is about creating a shared vision between organization and employee—"a shared vision and shared goal of where this company is going and how the company solves problems and using that as a way to motivate people to bring their whole selves to work."

Empowering employees to make decisions without consulting management has been shown to increase workplace happiness. The reverse is also true; if an employee with higher-level experience is swamped by requests for lower-level decisions, removing his/her authority to participate in those routine tasks (by limiting access to a program or a request form, for example) can free his/her to do their best work.

Employee ownership, as touched on above, lets workers feel more in control of their lives and more invested in the company. Likewise, giving employees stable schedules makes them feel that they are an important, integral part of a company, while "just-in-time" scheduling creates the impression that workers are mere commodities, which again amplifies an employee's fear.

Employees who are bereft of information about what is going on in an organization find it difficult to grow within it. Dorie Clark, an author and lecturer specializing in professional development, speaks of employees who have reached a certain plateau in their career of promotion, seniority and income, only to realize that they have 10 or 20 years left until retirement. They have networks—their colleagues, their contacts, the

people they have worked with—but they do not have a reputation in the marketplace. In the past, companies had defined ladders of promotion. But now, they are desperate to have their employees take agency over their own career path and direction. Some, perhaps rightly, look at this as organizations shirking their responsibilities in employee development. But because truly valuable learning is increasingly centered on exceptions, companies want employees who can build their own ladders—or whatever other model maximizes their potential for the business.

"I think there's two factors that particularly interest me here," says Clark. "One is this idea about specifically what companies can do to cultivate an entrepreneurial mindset in their employees, to both give them permission and encourage them with the tools and knowledge to be able to take that agency. And the second is the big gap that I see between the highly self-motivated employees and the ones that are not." This second class may be perfectly good employees, and they have a multitude of tools to teach them new skills, but they simply do not have the drive. Companies will have to create environments where these types of employees can be successful.

There will always be workers who work primarily to make ends meet. Currently, they do their jobs the way they have been trained to, and do not strive for more because reaching creates risk. Companies will have to communicate better with them to help them develop and give them space to recognize problems and propose solutions.

Most of this fear of commodification is often focused in the lower levels of organizations. There, workers can see technological changes coming and are not confident in the human value that they add. According to MetLife Executive Vice President and Chief Human Resources Officer Susan Podlogar, the company is focusing on helping build employee confidence to face a more technologically driven future. With a focus on education—both awareness-based and skill building—the company has set up the Workforce for the Future Development Fund. "We're teaching every single employee, no matter what level they are, about the fundamental future of work, and the new digital skills that workers may need. There's a robust human skills and technology curriculum so they have confidence that no matter where they are—and no matter what company they end up working for, with MetLife or another—they can contribute."

As algorithms become more powerful, a significant portion of the workforce will be moving into augmented work. In some cases, this augmentation can be quite literal; we can upskill people by putting some new skills into a device they already know how to use. For a decade now, companies have been giving tablet computers to home healthcare workers. This helped automate their work, which makes those who quest for efficiency happy, but it also sends a message: "We still need you to go visit; we just want to take away the drudgery."

As a group, corporations can do more to ensure the portability of skills. A certification in digital skills from one company may mean nothing to another. And to make things worse, many companies operate on proprietary systems, making skills portability all but impossible—and that is before any form of non-compete agreement is added.

"If we're going to get to a skill based continuous arc throughout a person's life, there's got to be some agreement of what the skills are," says Governor Hickenlooper. How can we measure competency in a way that can be recognized industry-wide? The answer is to share intellectual property around training and competencies, to enable more—not less—employee mobility.

Retraining, Reskilling and Rehiring

"Today I would say many companies think it's easier to hire new people with new technology skills than retrain," says Lara Warner, Chief Compliance and Regulatory Affairs Officer of Credit Suisse Group. There needs to be an economic model that makes retraining more valuable than shedding the old and bringing in the new.

"Today … many companies think it's easier to hire new people with new technology skills than retrain." *– Lara Warner*

With the half-life of new skills so brief, employees entering the market right now may have four or five major careers. This can mean either five careers with five companies, or five careers within the same company, but there is no reason to be that binary. If a company can create

the right on- and off-ramps, says Warner, employees "may be with you in Chapter 1, they may not be with you in Chapter 2 and 3, and then you might want them to come back in Chapter 4."

"I think to enable great talent mobility, we need something radical where we don't have employees anymore; we stop pretending that we own people." – *William Huffaker*

Of course, all this may not be at the employer's discretion. For a variety of reasons, professional and personal, employees may wish to take some time off—and they should not be penalized for it when they return. William Huffaker, Vice President of Inclusion & Diversity, and Talent of SC Johnson says, "I think to enable great talent mobility, we need something radical where we don't have employees anymore; we stop pretending that we own people." He points out that our reward schemes are portable with benefits and pay, as are retirement savings through programs like the 401(k). He suggests that it is time for hiring managers to stop stigmatizing people for moving around between companies, especially when those types of lateral moves bring more knowledge to the hiring company, and often offer salary bumps to the employee.

In the transitions between those jobs, employees should be able to develop more skills, though most human resources professionals are a bit cynical about the concept, especially for the lower half of the work force. "Reskilling is basically taking workers who are doing routine tasks and giving them a new set of skills to do another set of routine tasks," says John Hagel. "That's not, in my view, redefining work." Besides, very few employees have the kind of support they need to take time off to learn even valuable new skills. And while corporations seem to find the money to educate and inspire their executives, they often leave retraining of lower-level employees to inadequate government programs—and that, unfortunately, is usually after the employee is let go.

It is often suggested that society needs more safety nets, but Jeff Schwartz of Deloitte Consulting suggests the term "transition nets" instead. "If we can't support transitions, both in the corporate world

and as individuals, we're basically saying we understand what the world looks like, but we have neither the career or occupation or educational programs to go forward." In public policy terms, that might mean guarantees of continuous and stable health care between jobs and government-funded educational benefits. Safety nets help people who are falling; we need a system that will keep them from falling in the first place.

Rethinking Recruiting

Organizations are hiring now for a new future. That will mean less and less hiring for skills and more and more hiring for the ability to learn. William Huffaker suggests that employees can be agnostic to the companies they work for if they are true to their personal identities and value sets. When companies recruit, it's largely a game of salesmanship for both parties, with the goal being trying to mold an employee to fit an empty slot. What we need instead is an exchange that starts with "Here's who I am," and continues to "Do we have a good match, and can we go forward?" Added onto the duties of human resource managers should be honoring the identity of the potential employee.

That means honoring skills outside of a specific, expected set. Right now, job descriptions read like pedigree proxies, with requirements echoing the credentials of the people previously employed. Often these proxies echo cultural biases and are therefore pernicious at excluding people of color. This robs companies twice: first by excluding promising candidates from the search pool, and later by robbing the organization of the valuable insights that come from a diversity of viewpoints, knowledge and problem-solving strategies.

Karan Chopra at Opportunity@Work says, "A four year degree requirement on a job description is exclusion. A keyword filter looking for years of experience for an entry level job is exclusion. And the reason I think this is so important is because this is the demand signal into the entire labor market." If an applicant has the relative skills but does not meet the machine-filtered minimum requirements, there is no reason to even apply, and that is wasting talent and the potential of individuals. Algorithmic screening process—which are fed data that reflects the status quo and reflect the biases borne of non-inclusive data sets—are filtering out promising candidates before humans ever have a chance to make a hiring decision.

Even before the application process, workers from marginalized communities find themselves excluded through social circumstances. Chopra notes that people of great promise may never have the opportunity to discover where their skills lie, because they do not have access to the knowledge required to gain those skills. "If I want a job today," says Chopra, "I have five people that I can call who will give me some guidance. That doesn't exist for a lot of people today."

Companies in a new work environment should recognize skills outside of the context of a degree. Governor Hickenlooper notes, "Someone told me the other night, we have 90 percent dropout rate in our community colleges. That's not dropout. They're going there to get one specific skill." Steven Spear of MIT concurs. "It's very possible you didn't get your college degree not because you're just dumb as a rock, but more likely than not it's because some problem arose in your life which you had to solve. And college wasn't the vehicle or the vector to solve that problem. But we don't scan on that. We scan on whether you completed the milestone rather than how you solved the problem."

The exclusionary process begins even before the job search, of course. Individuals need ways to enable discovery, feedback and guidance as they gather skills. How does a worker learn what he/she is good at? How does he/she know what the opportunities are? How can he/she develop the skills she needs, and fill in the gaps where they need extra training? "One of the biggest barriers that I have seen for learning are actually things like trauma, things like imposter syndrome—I do not belong, or that everything I've done in my life has led to failure, and so how do I know that this is not another door that's going to be shut in my face down the road?" says Chopra. He notes that there are many people who do not even know what job roles exist or what skills are needed for them, because workers do not have a mentorship structure that goes beyond their limited experiences. "There are 200 plus classifications in BLS (U.S. Bureau of Labor Statistics) on high level job categories, and you ask some people, 'What jobs do you think you can do?' they can name five, and those would be what has been true in their community—nursing or home care, but not, 'Oh, maybe I can be a DevOps engineer.'"

Peter Fasolo of Johnson & Johnson is frank about where the change will need to emerge. "The quality of candidates is not the issue we are addressing here, it's how we articulate the skills we need so that we're

searching and selecting in the right way. These conversations need to occur at the very top of the organization, so that human resources and campus recruiters can create the right opportunities."

The Future of Leadership

When things are stable and well-defined, and organizations know what they are going after, then it is easy to put leadership on autopilot. In a time of change and transformations, however, leadership is going to matter much, much more.

If a Chief Executive Officer…is concerned about succeeding in an environment that is constantly changing, then learning has to be the objective function.

Leaders need to be catalysts, architects and visionaries. Leaders need to ask the right questions, to see a future and mobilize and to move toward it. In most cases, those are not the leaders we have today. "We line up attributes of what we want to see in leaders: full of ideas, inspirational," says Erica Volini, Principal at Deloitte Consulting, "but few meet all those characteristics. We dilute until we get someone who is mediocre at lots of things, who is the least offensive."

If a Chief Executive Officer—or any other leader, at any level—is concerned about succeeding in an environment that is constantly changing, then learning has to be the objective function. Absent that, the value of the knowledge and skills they currently possess will degrade, as will the relevancy of their organizations. The best leaders do not know best.

The leader of tomorrow will not be on the pedestal they are on today. They will likely lead and follow by turns, as inquiry leads them. Leadership will not be a permanent role. This will be a difficult fit with the organizational hierarchy of today, because business systems are built on that hierarchy. The highest ranking people are making the decisions and making the most money. Inquiry-centered decision

making requires a very decentralized system, one that will need to self regulate and also kill itself off when a process is finished. And giving up decision-making power is hard.

This is a reimagination of what strategy and management is, creating a leadership system that is more about directing inquiry rather than making decisions.

"If you want teams to be solving at the edge and emergently creating knowledge," says Better Up's Alexi Robichaux, the CEO's job "increasingly becomes communicating strategic context and the types of problems non prescriptively…creating enough gray space that I can be surprised that within this class you found a new method or you found a new attribute that actually solves a problem that I hadn't even fully defined." This is a reimagination of what strategy and management is, creating a leadership system that is more about directing inquiry rather than making decisions.

Coaches, Artists and Protectors

The organizations that succeed will be the ones who can figure out leadership as a coaching and developmental role; those who do not will never acquire the agility that they need. Yet, organizations often define leadership as a decision-making transactional role.

Instead, a leader needs to be responsible for setting up and architecting the system so that it works on its own. In that way, leaders begin to look more like artists, creating new structures as the situation merits. These leaders will have to be comfortable letting go of control. They will have to ask the most inspiring questions, and challenge people to find the right answers. They will assemble inclusive and diverse teams and leverage different views for a better outcome.

And perhaps most importantly, when that better outcome arrives, the new leader will have to protect the disrupters. She/he will need to fight off the antibodies, the "helpers," and all the other ghosts of the scalable

efficiency mindset. She/he will have to recognize when the answers the edge delivers are truly the way forward, and they will have to have the courage to kill the core. Business will never change otherwise.

Decentralizing Leadership

There is a distinction between "leader" and "leadership." A leader is a person, but leadership can be built into an organization's structure and can find presence in any employee. In a constantly changing "whitewater world," society must have leaders at all organizational levels, and the qualities of leadership must be infused throughout the culture through teamwork, mentorships and an emphasis on learning. Society must have a workforce full of people who can read currents, who can see change coming, and who have the autonomy and authority to ride the rapids on the behalf of their employer.

A leader is a person, but leadership can be built into an organization's structure and can find presence in any employee.

A great leader will hire people for what they know and what they do, and then get out of the way. They will push responsibility to as far down the organizational ladder as possible. The more individuals at different levels are empowered, the more they feel part of something bigger. A leader, then, will be the one who can harness the promise of technological progress—the machines, the bots and the algorithms—to finally make work more human.

APPENDIX

The Future of Work 2.0: Navigating the Transition to New Possibilities

Aspen, Colorado
August 9-11, 2018

Conference Participants

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

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David K. Gibson is a writer, editor and communications consultant based in Orlando, Florida, where he is the principal of Dystacorp Light Industries LTD. He has a fifteen-year history with the Aspen Institute and the Aspen Ideas Festival.

Gibson writes for a variety of editorial publications on subjects that range from architecture to luxury travel to traffic flow dynamics. He also advises companies—particularly new businesses and those going through rebrandings—on messaging and development of consistent identities, particularly in the area of corporate voicing. He has written style guides, annual reports, crisis letters and a mountain of advertising copy.

He is an anthologized writer of short fiction, a food-obsessed travel writer, and the proud owner of a BA in Philosophy from Yale University. Formerly, he was a magazine editor-in-chief (thrice over), teaching chef, partner in an AI-based psychographic recommendation engine startup, and a Mississippi Forestry Commission Employee Level 2.

About the Communications and Society Program

www.aspeninstitute.org/c&s

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

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

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

Previous Publications from the Aspen Institute Roundtable on Institutional Innovation

(formerly the Aspen Institute Roundtable on Talent Development)

The Exponential Shift: Rethinking Organizational Business Models *(2017)*
In a world of rapid fluctuations, disruptive innovations and exponential growth, organizations are finding that their business operating models are in need of significant revision. This report, titled "*The Exponential Shift: Rethinking Organizational Business Models,*" examines new ways of thinking about organizational performance and conceptualizes what it takes for an organization to shift from pursing efficiency to embracing continuous learning and constant change. 67 pages, ISBN: 0-89843-667-2, $12.00 per copy.

Making the Invisible Visible: Redesigning Business Processes for Exponential Organizations *(2016)*
Making the Invisible Visible, the report from the 2015 Roundtable on Institutional Innovation, explores how corporate leaders are thinking about exponential business operations—utilizing digital technologies to leverage assets and scaling learning to accelerate innovation. It delves into strategies of modularization, rapid iteration, and utilizing transparent metrics, among others, all with the aim of becoming more adaptive and increasing performance of the organization. The report is written by Richard Adler. 63 pages, ISBN Paper: 0-89843-644-3, $12.00 per copy.

Navigating Continual Disruption *(2015)*
Navigating Continual Disruption, the report from the 2014 Roundtable on Institutional Innovation, explores ways to manage organizations in the face of continual disruption—the constant onslaught of new offerings or business models that can challenge the dominance of core businesses. The report is written by Richard Adler. 66 pages, ISBN Paper: 0-89843-617-6, $12.00 per copy.

Fragmentation and Concentration in the New Digital Environment *(2014)*
Fragmentation and Concentration in the New Digital Environment explores the impact of digital technology infrastructures on the fragmentation and concentration of economic activity. This report, written by Richard Adler, maps the effects of the digital revolution on the business environment, the nature of work and the role of leadership in navigating the organization through the constantly changing landscape. 54 pages, ISBN Paper: 0-89843-606-0, $12.00 per copy.

Connecting the Edges *(2013)*
Connecting the Edges is the report from the 2012 Roundtable on Institutional Innovation. In the current economic environment, growth and underemployment are two outstanding national, indeed international, problems. While technological advances and globalization are often cited as instigators of the current plight, they are also beacons of hope for the future. The report concludes that by integrating the core of an organization with the edge, where innovation is more likely to happen, we can create dynamic, learning networks. 46 pages, ISBN Paper: 0-89843-589-7, $12.00 per copy

Institutional Innovation: Oxymoron or Imperative? *(2012)*
Institutional Innovation: Oxymoron or Imperative is the report of the 2011 Roundtable on Institutional Innovation. It explores the consequences of the growing disconnect between the fundamental design of most firms and the capabilities of the business infrastructure in which they operate. The report, written by Richard Adler, captures the insights of the participants with a focus on identifying conditions that are favorable to institutional innovation and maximizing the effectiveness of institutional leadership. 63 pages, ISBN Paper: 0-89843-572-2, $12.00 per copy

Solving the Dilbert Paradox *(2011)*
Solving the Dilbert Paradox is the volume resulting from the 2010 Aspen Institute Roundtable on Talent Development. This "Dilbert Paradox" finds expression in wasted opportunities for organizational learning, collaboration, and access to knowledge and ideas outside the corporate hierarchy. The report, written by Richard Adler, captures the insights of

the participants during the conference and details how some large organizations, as well as start-ups and small companies, are experimenting by giving employees new opportunities to maximize innovation. 48 pages, ISBN Paper: 0-89843-545-5, $12.00 per copy

Leveraging the Talent-Driven Organization *(2010)*
Leveraging the Talent-Driven Organization details how a number of firms are using social networking tools to open up communication, collaboration and learning across boundaries, and leveraging these tools to develop new products and real-time solutions for customers. The report, written by Richard Adler, is the result of the Inaugural Roundtable on Talent Development. 48 pages, ISBN Paper: 0-89843-519-6, $12.00 per copy

Talent Reframed: Moving to the Talent-Driven Firm *(2009)*
Talent Reframed: Moving to the Talent-Driven Firm offers new rules for organizations seeking to attain and develop a talented workforce amid a rapidly changing and increasingly globalized business environment. The report, which sets the premise for a new series of Aspen Institute Roundtables on the Talent-Driven Firm, explores how organizations can build talent by relying less on traditional command-and-control structure and more on horizontal collaboration and shared learning. The report, written by Richard Adler, also features a white paper by John Hagel and John Seely Brown. 46 pages, ISBN Paper: 0-89843-498-X, $12.00 per copy

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