


Preparing for an Era of Talent Scarcity

The Evaporating Technology and
Research Talent Pool

SMITHGROUPJJR



At SmithGroupJJR, we strongly believe that our planning and design approach is aligned with our clients' current missions and future challenges. Our Client Advisory Board was created as a forum to ask questions and explore ideas with leaders from scientific and research facilities across the country. These exchanges lend mutual insight and energize our planning and design process with our shared experiences, evolving our practice towards anticipating future demands within the Science & Technology marketplace. Our 2016 Client Advisory Board's theme was Preparing for an Era of Talent Scarcity: The Evaporating Technology and Research Talent Pool. Held at the University of Pennsylvania Neural and Behavioral Sciences Building, we had an engaging exchange of ideas focused on disruptors, changing work cycles, skills gaps and the blurring of boundaries. Feedback, idea-sharing and further discussion are appreciated and welcomed.

Many thanks to our advisors and SGJJR participants who came and freely exchanged ideas and discussion.

California State University
Clemson University International Center for Automotive Research
Michigan State University - College of Human Medicine
Michigan State University Extension
University of Illinois Research Park
University of Texas at Dallas

Our world's population is both growing and aging: By 2050, one in six people will be over age 65, resulting in one billion more retirees than today. The shifting demographics will leave us with a significant deficit of older, experienced leaders — soon to be compounded by a shortage of younger individuals with the skills to excel in the research and technology sectors.

To better prepare for this era of talent scarcity, SmithGroupJJR's Science and Technology Advisory Board identified five trends worth exploring:

TREND #1 Disruptors are Shaking Up Every Industry Sector

Even as we face a future filled with disruptive change, we look at solving problems through the lens of the trends we know and can predict. We need a different paradigm that embraces the premise of uncertainty. Successful organizations look for, encourage and accept the fluidity of change, able to adapt to the "unknown knowns."

TREND #2 Longer Life Spans are Changing Work Cycles

Workers are more interested in multi-stage careers that will sequence in different ways than today's model. To attract and retain talent in this new multi-generation workforce, organizations need to broaden their perspectives regarding cross-training, compensation, time off and other human resources policies.

TREND #3 Education isn't Aligned with Today's (or Tomorrow's) Industry Needs

There's a growing skills gap between what the educational system teaches and what the research and technology sectors require. The disadvantaged population is an example of an untapped resource for educational training and industry talent pipelines. Education and industry need to partner together to attract students and align their studies and skillsets with real-world needs.

TREND #4 Companies are Leveraging the Power of Local

Don't underestimate the power of place. Talented workers are drawn to genuine need, an inspiring work environment and a sense of true community. In an age where Millennial work styles are so varied, place truly matters.

TREND #5 Traditional Boundaries are Eroding

Today's work environment has fewer distinct boundaries regarding career paths, disciplines, work schedules and workspaces. Tomorrow's workers will continue to redefine the culture of the workplace.

These trends offer some insights for organizations faced with an impending human resource shortage. The Advisory Board discussed how to rethink programs and workspaces in the technology and research environment to accommodate the shifting demographics and values. The good news is, the physical and cultural environment of the workplace can be an effective strategic tool to attract, retain and inspire talent.

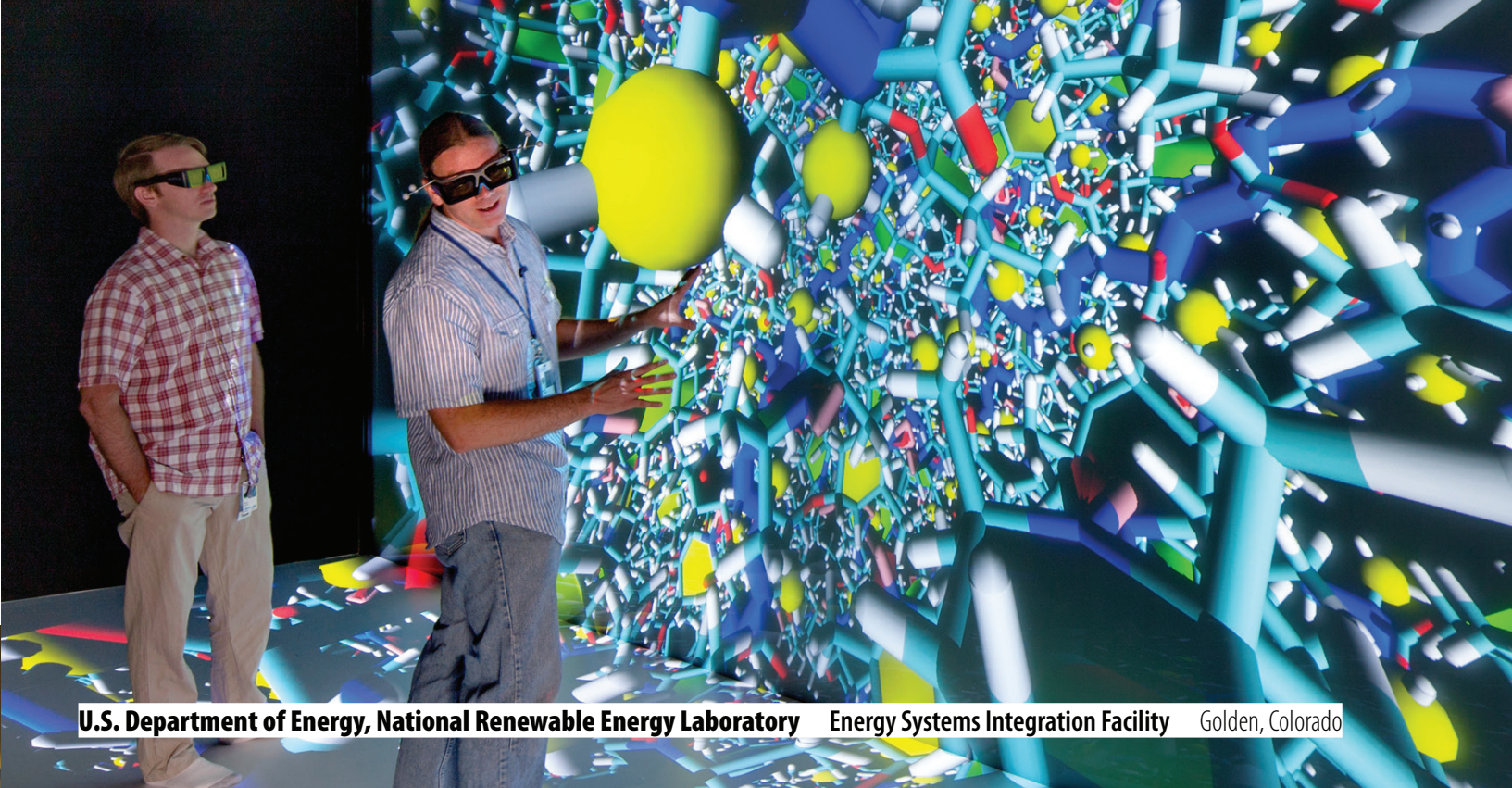
By 2050, the global population is expected to soar by 30 percent. As our world grows, it's also aging: one in six people in 2050 will be over age 65, resulting in one billion more retirees than today. The shifting demographics are already at play in the United States. The large population of Baby Boomers, who often followed a rather linear career path, is followed by a much smaller population of Gen X workers, who are less likely to pursue a singular career. Following them is Gen Y ("Millennial"), a large population whose preferred work styles are at odds with today's corporate structure, yet will be thrust into management positions at a much younger age. In turn, Millennials will have an earlier impact on the company culture and work/life expectations of the coming generations.

It all points to a significant deficit of older, experienced leaders — soon to be compounded by a shortage of younger individuals with the skills to excel in the research and technology sectors.

So how do we prepare for this era of talent scarcity? SmithGroupJJR's Science and Technology Advisory Board spent a day examining trends and sharing educational and workplace experiences — exploring how we can best inspire, train, recruit and retain that shrinking pool of talented individuals who will lead the successful tech and research teams of tomorrow.



University of Southern California Mark and Mary Stevens Neuroimaging and Informatics Institute Los Angeles, California



U.S. Department of Energy, National Renewable Energy Laboratory Energy Systems Integration Facility Golden, Colorado

TREND #1 Disruptors are Shaking Up Every Industry Sector

Disruptive forces are occurring all around us — not simply improving existing products and services, but creating something completely new in their place. Digital cameras upended film, only to be upended by mobile phones; crowd sourcing is redefining everything from taxi services to venture capital. Technology will continue to accelerate this disruption, by providing greater connectivity and access to data that changes how we live, work and play.

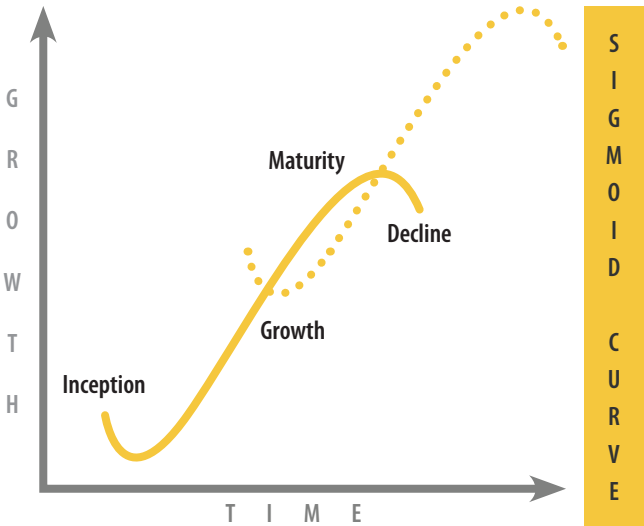
Yet even as we face a future fraught with disruptive change, we look at solving problems through the lens of the trends we know and can predict. We need a different paradigm of thinking that examines the “unknown knowns.” To actively manage disruptions:

- Rethink Talent. Seek different perspectives and divergent views.
- Rethink Workspace Fundamentals. Envision new ways to provide physical and virtual environments to bring ideas together.
- Rethink License. Give workers greater autonomy, flexibility and freedom to think and execute.

Astute organizations seek to eliminate the isolated silos that lead to traditional thinking. SmithGroupJJR's Arnold Levin suggested they also take heed of the mathematical concept of the Sigmoid Curve: Organizations operate in a natural cycle of introduction and

implementation, then growth toward a pinnacle, then decline. Companies that understand this process are better prepared to recognize when it's time to reinvent — i.e., to move onto the next curve — before the current curve bottoms out.

In other words, embrace the idea of uncertainty. Instead of asking, “How can we do the same thing better and faster than our competitors?” better to wonder, “What might be?”



TREND #2 Longer Life Spans are Changing Work Cycles

Remember when age 65 was anointed as the year to retire from one continuous, 40-year career? Many of today's workers don't. And tomorrow's workers certainly won't.

As people live longer, the concept of "working years" is evolving. Our society has already moved beyond the traditional three-stage framework of 1) youth and schooling 2) adulthood with a deep commitment to work, and 3) retirement. The typical work phase will likely expand from 40 to more like 70 years, although with little expectation that it will be in the same role or with the same employer. People are more interested in a multi-stage life — starting work later, working longer, taking breaks, then returning to work.

Today's workers also express a growing desire to pursue different types of vocations — reaching into other disciplines and reinventing themselves throughout their career. Especially as they age, they place a higher value on working for a social cause, more interested in the "greater good" than in corporate loyalty. That trend will be even more pronounced with Gen Y workers, who already demonstrate those traits more than the generations before them.

To attract and retain talent in this new multi-generation workforce, Human Resources might consider transforming policies such as:

- Eliminating graduate intern programs
- Onboarding creative entrepreneurs
- Offering mid-career break options
- Providing more options for work/life balance
- Cross-training throughout the organization
- Delinking pay and age
- Reassessing annual salary reviews
- Delaying retirement plans, and
- Rehiring senior managers in junior roles.

Source: THYLplc

To attract and retain talent in this new multi-generation workforce, organizations need to broaden their view of human capital, understanding that careers will sequence in different ways. The presentation by SmithGroupJJR's Arnold Levin and Marilee Lloyd suggested the need to rethink everything from graduate recruitment to executive compensation.

As workforce needs and values change, companies will need to rewrite their social contract of work to attract and retain talented leaders.



TREND #3 Education isn't Aligned with Today's (or Tomorrow's) Industry Needs

The group discussed what some saw as a growing skills gap between what the educational system teaches and the specific, work-based skill sets the research and technology sectors require. They suggested that this disconnect is not being addressed adequately or quickly enough, and threatens to hinder our entire economy. If students aren't getting the preparation they need to succeed, they risk getting left behind. If industry can't tap into a new workforce, they can't leverage potential new talent. Education and industry need to partner together, to attract students and align their studies and skillsets with real-world needs.

It is widely reported that many high school students lack proficiency in math and science. Too many graduating students are not prepared to enter the workforce nor pursue continued education, yet the U.S. job market will continue to demand higher-skilled workers. Programs like California State's Linked Learning programs seek to narrow this skills gap by aligning academics with pathways to specific industry sectors. Unlike the vocational/technical schools of the past, these programs prepare students for college and professional career with rigorous study, work-based learning and intensive student support.

Post-secondary educators can also reconsider how they structure their colleges and degree program requirements. In the United States (and many other Western cultures), universities often isolate their students into hyper-focused fields of study. Many corporate career paths do the same. As a result, many people spend their lives learning more and more about less and less. It creates a narrow talent pool of highly specialized workers — at a time when industry has indicated a need for a broader talent pool with a wider array of skills.

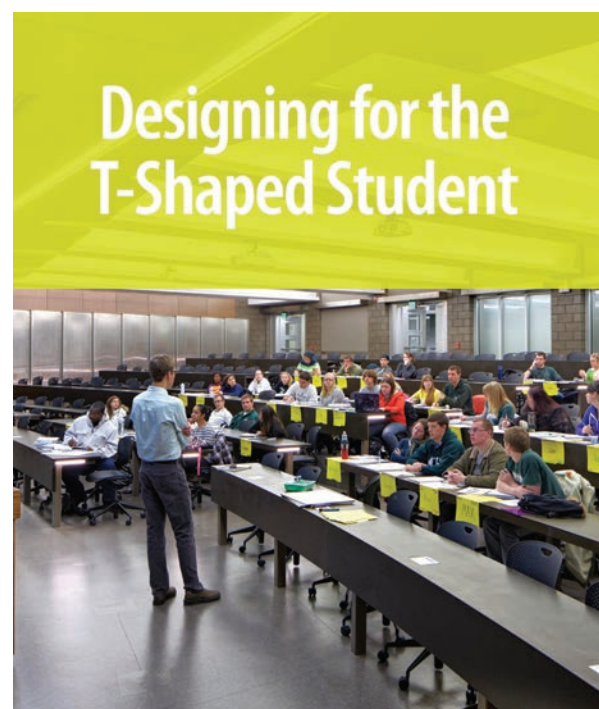
University-affiliated research parks are perhaps the most visible examples of how education and industry can work together to nurture talent. One successful current day example is The Research Park at the University of Illinois (ILLINOIS), home to 100 companies, employing approximately 1,700 regular employees and 600 students. It creates a technology community where businesses can collaborate with university faculty, gain access to research facilities, and tap into a pipeline of eager, bright, students. University students gain valuable internship experience and, after graduation, greater job placement opportunities in high-value science and tech jobs. What's more, companies have discovered that working with students gives them the freedom to operate like innovation centers. They can be as nimble as startups — hiring quickly, building and testing prototypes, and moving on without significant implications if a project isn't successful. The future potential for this model is limitless.

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SmithGroupJJR's Science & Technology Practice addresses the industry requirements expected of forensic graduates.

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SmithGroupJJR's Higher Education Practice discusses the "T-Shaped Student" with a wide array of skill sets.

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University of Illinois at Urbana-Champaign Electrical and Computer Engineering Building Champaign, Illinois

TREND #4 Companies are Leveraging the Power of Local

Clearly, research parks like the ones at the University of Illinois and Clemson University can benefit the university community and strengthen the regional economy. The trick is recruiting the companies in the first place. ILLINOIS goes to great lengths to foster the local connection, hosting numerous open houses and “reverse” career fairs to connect students with the local science and tech firms. As a result, companies with a presence in the ILLINOIS Research Park get direct access to the university’s best and brightest — the golden ticket to recruiting top-tier talent. In addition, ILLINOIS works hard to build a culture and community feel that goes beyond study and research, and includes events, amenities, and an esprit de corps that helps retain their talented student base and professional workforce.

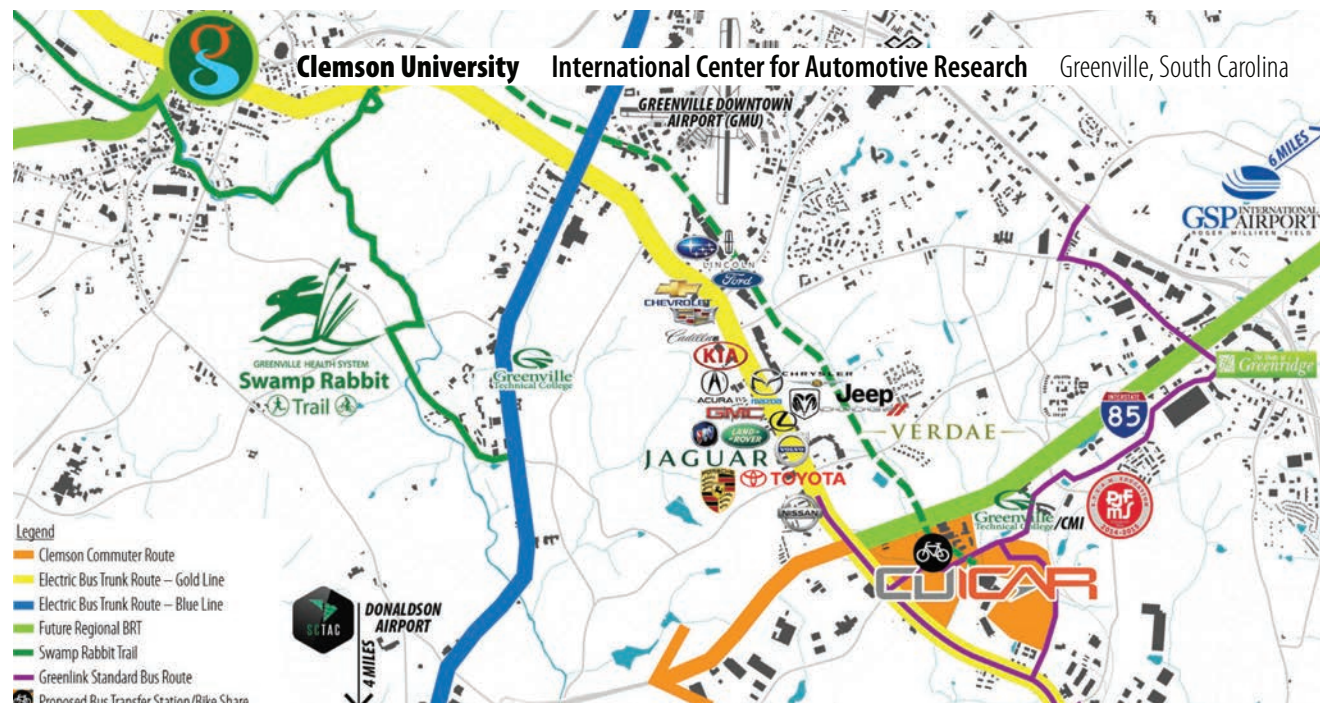
Clemson University originally envisioned its International Center for Automotive Research (CU-ICAR) as a public-private partnership to meet the needs of the motorsports industry. Today, CU-ICAR has broadened its focus to become a leading research and development center in mobility and transportation globally, where automotive companies work together on applied research. CU-ICAR has created a unique innovation eco-system that emphasizes interdisciplinary programs, leverages the talents of the university, and creates a vibrant, collaborative community that attracts talented workers.

Organizations can also appeal to workers’ desire to contribute to the greater good. When the Flint campus of Michigan State University sought to recruit research faculty for its Public Health program, many were skeptical that the beleaguered city could draw top talent. Yet the city’s reputation had an unexpected consequence: It became an attribute, drawing highly skilled researchers from major institutions. They saw a community with a real need where they could make a real difference, and signed on for positions that they wouldn’t have accepted on other campuses.

Talented workers may not be so different than top athletes: They want to align with a team where they can make a difference, not just earn a salary. A genuine need, an inspiring work environment and a sense of true community can be valuable differentiators.

Deloitte and the Manufacturing Institute conducted a survey in which 53% of top executives cited difficulties in making positions appealing to engineers, researchers and scientists due to plant-like and unappealing industrial environments.

-Deloitte Skills Gap Survey, 2015



TREND #5 Traditional Boundaries are Eroding

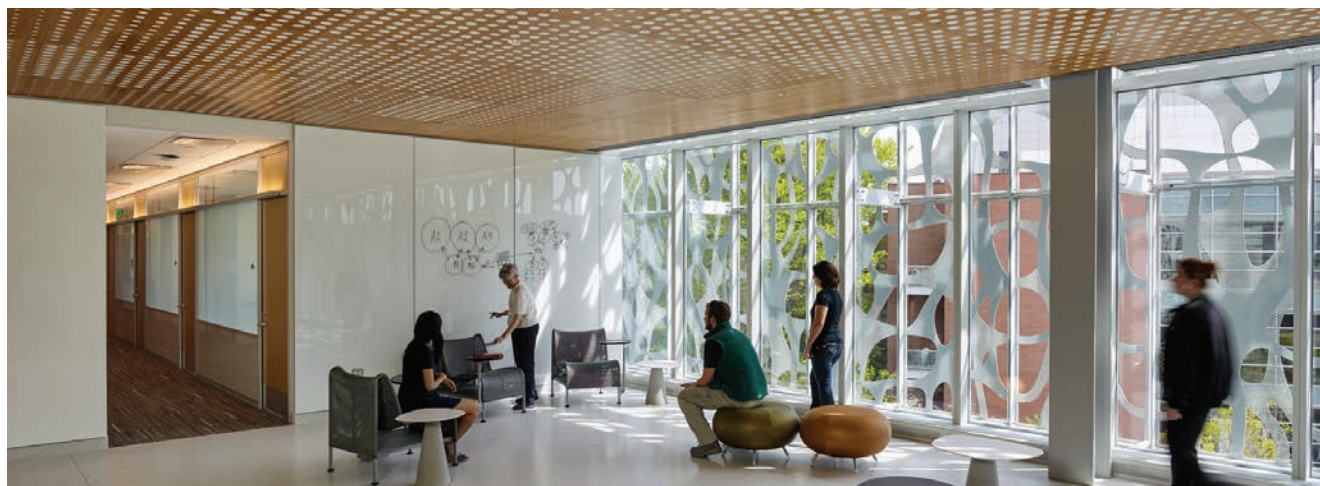
The workforce is constantly evolving. We've all experienced significant change over the course of our own careers; research environments of yesterday and today are no doubt out of step with how Gen Y and Gen Z will want to work. Universities and organizations across the globe are responding, and traditional boundaries are blurring in a number of ways.

- **Disciplines are blurring.** Rather than confining students and workers in silos of specialization, institutions and organizations recognize the value of interdisciplinary collaboration and convergence. Innovation occurs when ideas can cross-pollinate. This is demonstrated by the way in which physical lab spaces have evolved over time. New disciplines are being created. Co-working spaces, research parks and other collaborative work environments reflect how today's employees want to operate, thus aiding recruitment efforts.
- **Career paths are blurring.** Every generation brings a new perception of what a successful career looks like. Savvy organizations will make an effort to understand their workers' aspirations — for professional challenge, rewards, work-life balance and so on — and develop the training and development functions to accommodate their priorities.
- **The workday is blurring.** Productivity no longer happens in one fixed place, but rather in a floating space at all different times. As long as workers have access to the core technology they need, they decide when, where and with whom they work. Innovation districts further blur the work-life boundary, blending residential, professional and social activities in one immersive community.

Work and career is already operating on a completely different level than years of past, testing and playing with boundaries to discover new possibilities. The Advisory Board noted that physical environments will need to become more than the sum of their parts, to foster new cultures of community, collaboration and creativity. The workplace can't do it alone, but for an organization willing to embrace new schools of thought, the physical and cultural aspects of science environments can indeed play a key role in attracting, retaining and inspiring talent.

*"A little bit of silo is not all bad.
Secret society, not so cool"*

— David Johnson,
SmithGroupJJR



Additional Resources

Reading Material

The Fifth Age of Work: How Companies Can Redesign Work to Become More Innovative in a Cloud Economy, by Andrew Jones, PhD

The Silo Effect: The Peril of Expertise and Promise of Breaking Down Barriers, by Gillian Tett

The Age of Unreason, by Charles Handy

The Age of Paradox, by Charles Handy

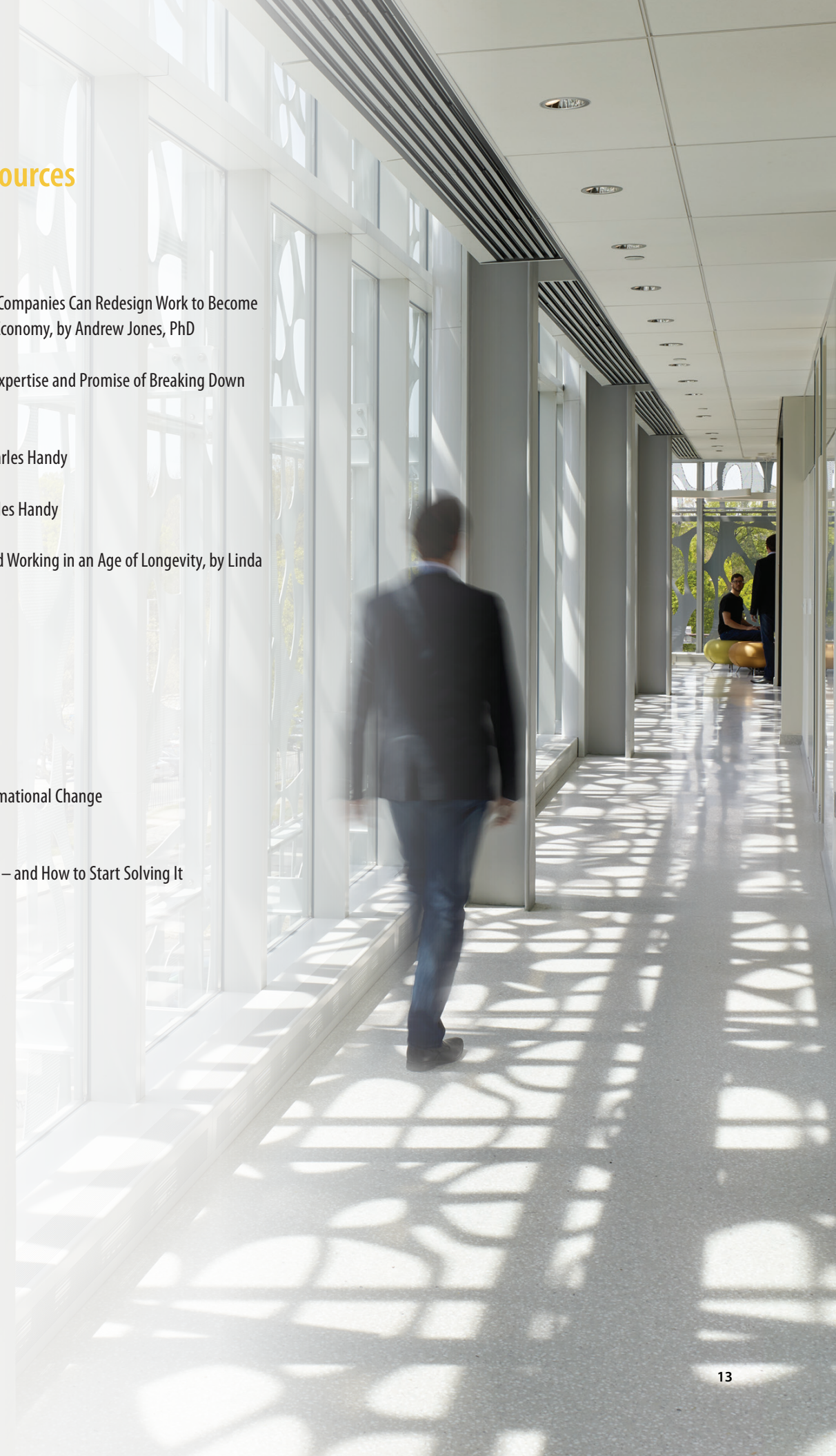
The 100-Year Life: Living and Working in an Age of Longevity, by Linda Grafton and Andrew Scott

Web Links

The Sigmoid Curve | S Curve
[YouTube Link](#)

The Key to Growth: Transformational Change
[YouTube Link](#)

The Workforce Crisis of 2030 — and How to Start Solving It
[YouTube Link](#)



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