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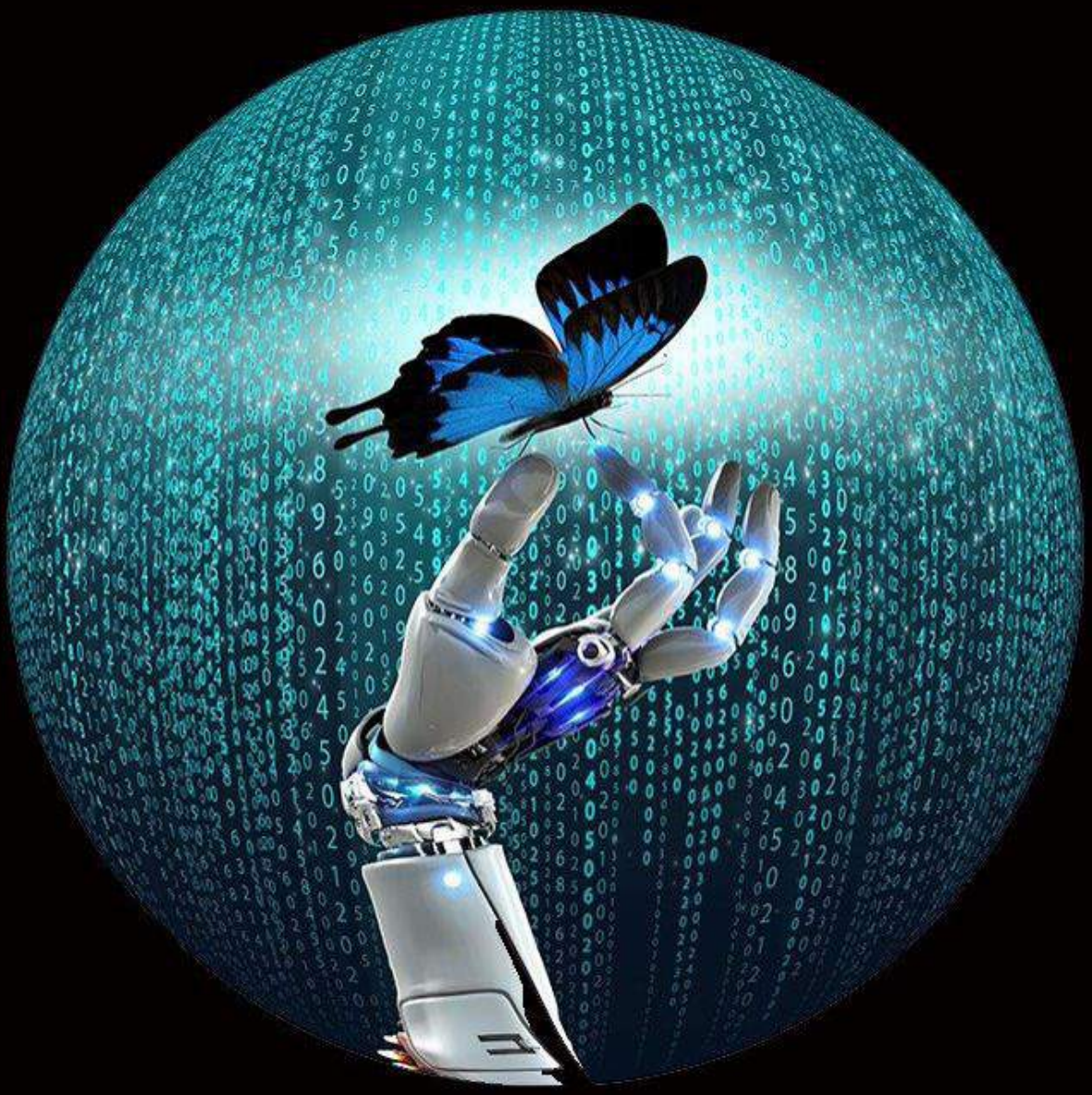

Future of Work Compendium

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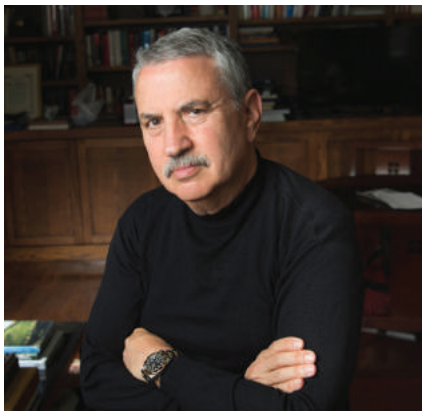


Radically open

Tom Friedman on jobs, learning, and the future of work

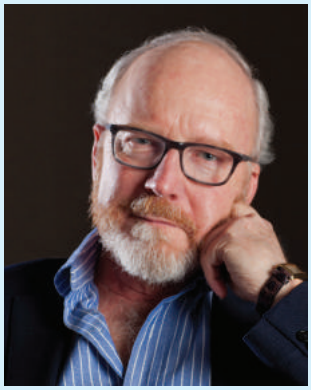
By Cathy Engelbert and John Hagel
Photography by James Kegley

Foreword by John Hagel

Tom Friedman is a well-known Pulitzer Prize-winning weekly columnist for the *New York Times* and the author of seven best-selling books. His insightful work covers a broad range of topics, including globalization, the Middle East, and environmental challenges. I have always been amazed by Tom's ability to see the deeper patterns emerging from beneath the headlines and to anticipate where the world is headed. He resists the temptation to segment and silo; what intrigues him are the connections that drive and shape the evolution of an increasingly complex world.

Cathy Engelbert, CEO, Deloitte US

One of the things that attracted me to Tom many years ago was his desire to explore and understand emerging edges—initially marginal but potentially transformative marketplace phenomena driven by rapid advances in digital technology. We connected over some writing that we had been doing in parallel on the growth of digital technology infrastructures and the increasing importance of richer knowledge flows on a global scale, and we have stayed in touch ever since.



John Hagel, co-chairman, Deloitte Center for the Edge

Our paths recently crossed again with the publication of Tom's newest book, *Thank You for Being Late: An Optimist's Guide to Thriving in the Age of Accelerations*. In this book, he cited some of the research being done at the Deloitte Center for the Edge and discussed a topic that I and others at Deloitte have also been exploring: the future of work. I couldn't resist reaching out to Tom to see if he would speak with Cathy Engelbert, CEO of Deloitte, and me on this particular topic. We ended up covering a very broad terrain with Tom and, in his usual fashion, he brought these diverse trends to life with compelling stories.

John Hagel: Given your broad perspective on global events, I suspect you have a unique perspective on the likely evolution of the future of work on a global basis. At a high level, how would you describe your view of the future of work?

Tom Friedman: My thoughts on the future of work are very influenced by my friend, a business strategist, Heather McGowan. She really describes that what's going on is that work is being disconnected from jobs, and jobs and work are being disconnected from companies, which are increasingly becoming platforms. That's Heather's argument, and that is what I definitely see.

[A good] example is what's happened to the cab business. In Bethesda, we have a [local] cab company that owns cars and has employees who have a job; they drive those cars. They're competing now with Uber, which owns no cars, has no employees, and just provides a platform of work that brings together ride-needers—myself—and ride-providers. And I do think that the Uber platform model, and the way it is turning a job into work and monetizing work, is the future of work.

And that will have a huge impact on the future of learning. Because if work is being extracted from jobs, and if jobs and work are being extracted from companies—and because, as you and I have both written, we're now in a world of flows[1]—then learning has to become lifelong. We have to provide both the learning tools and the learning resources for lifelong learning when your job becomes work and your company becomes a platform.

So I'm not sure what the work of the future is, but I know that the future of companies is to be hiring people and constantly training people to be prepared for a job that has not been invented yet. If you, as a company, are not providing both the resources and the opportunity for lifelong learning, [you're sunk], because you simply cannot be a lifelong employee anymore unless you are a lifelong learner. If you're training people for a job that's already been invented, or if you're going to school in preparation for a job that's already been invented, I would suggest that you're going to have problems somewhere down the road.

Cathy Engelbert: One of the things that I've been thinking about is the idea of "the future of work" versus "the work of the future." I always think "the future of work" sounds ominous, while "the work of the future" sounds more visionary. So what's the one thing you would advise leaders of companies like mine to do to prepare themselves for what I'll call the work of the future?

TF: The first thing that comes to mind is something I'm arguing for America in general right now, which is to do something that would strike many as deeply counterintuitive. That is, when we move into a world of flows, and the flows are the source of strategic advantage where you extract value, and the flows are

getting faster—all the phenomena that John [Hagel] writes about—it seems to me that rule number one is you want to be radically open. And that's a really hard sell right now, because it feels so counterintuitive, and everyone's putting up walls right when you want to be, actually, radically open. Why do you want to be radically open? Because you'll get more flows; you'll get the signals first, and you will attract more flow-minded people, which I would call high-IQ risk-takers. That's from a country point of view, but I have to believe that's also right from a company point of view: that you want to be plugged into as many discussions, as many places, and as many flow generators as possible, because you'll simply get the signals first in order to understand where the work of the future is coming from.

CE: In a recent report from the National Bureau of Economic Research, some leading labor economists did an analysis of net new employment in the United States between 2005 and 2015, and found that about 94 percent of that net new employment was from alternative work arrangements—everything from gig to freelance and off-balance-sheet kinds of work.[2] You've talked already about this notion of, increasingly, work being different from jobs and divorced from companies, which are becoming platforms. So do you believe this is a long-term development in the economy, that the gig economy is here to stay?

TF: Well, it has to be. It goes back to something I argued in *The World is Flat*, which is "Whatever can be done, will be done." The only question is, "Will it be done by you or to you?," but it will be done.

Let's use an example that people wouldn't normally think about, from General Electric. It's called "jump ball." So General Electric woke up one day in 2013 and said, "Geez, whatever can be done, will be done." So I'm GE now, and I'm trying to figure out how to get the most weight out of a fastener that fastens an airplane engine to the wing of an airplane. Now, when you take weight out of anything, especially on an airplane, you save fuel. So over the life of a plane, if you can actually reduce the weight of a fastener by 70 or 80 percent, you've saved enormous money. But GE sort of looked at itself internally and said, "Well, I live in a world now where I could actually take advantage of the brains of anybody to take weight out of this fastener." So they went to the main engineering website, GrabCAD, and they created a contest, which they called a "jump ball." They described the fastener they were currently using, the weight of that fastener under the wing of the plane, and simply threw up a jump ball: "Who in the world can take the most weight out of this fastener?" They offered $20,000 in prize money—$7,000 to the winner, and the rest split up among the other finalists. Well, within six weeks, they got over 600 responses. The 10 finalists were all tested by GE engineers, and they picked the winner. None of the 10 finalists was an American, and none was an aeronautical engineer, and the winner was a 21-year-old

from Indonesia who was not an aeronautical engineer, and he took more than 80 percent of the weight out of this fastener.

Now, what that tells me is, from GE's point of view, if it can be done, it will be done. The notion that, within our stock of engineers, we have all the best talent in the world—what are the odds of that in a flat, fast world? No, let's actually create jump balls and access all the talent wherever it is. Well, that's another version of that 94 percent that you don't think about; when you're not just thinking from the employee side, "I think I'll be an Elancer," but from the company side you're saying, "I live in a world now where I can access talent anywhere. If I don't do it from my point of view, my competitors will, so I better do it before it's done to me." I think that opportunity is going to drive change all across the spectrum. If you have a challenge that's posed to you, why in the world would you limit yourself simply to the talent within your own company? Because the odds of it being the best in this world are really pretty low.

JH: At least some of the statistics I've seen say that most of the gig economy today is made up of fairly routine tasks, like you mentioned earlier: driving a car, or translation services, or bookkeeping services. Do you see that being sustained? Looking at the trend in terms of technology, certainly in the mobility fleet operator business, a lot of companies are focused on developing autonomous automobile technology, and drivers go away. Do you see that as a significant issue in the gig economy?

TF: Well, my answer to your question is, study Airbnb. You could say that what Airbnb has done has threatened the job of maids, cooks, and hotel managers, because Airbnb has made more lodging available than all the major hotel companies combined. But look what those people are doing now. They're going into the travel business. They're going into the chef business, they're going into the tour guide business, they're going into the "I can provide your security key for 20 Airbnbs, I'll be the intermediary for you" business. So in other words, by creating this platform, Airbnb spun off a whole other set of opportunities for freelance chefs: "I'll come in and cook your meal." Freelance tour guides: "I specialize in art museums," or "I specialize in golf opportunities," or whatever. This is why I go back to my point about radical openness. On my gravestone, they can carve these words: "If horses could have voted, there never would have been cars."

> The day when you could just show up, work hard, and play by the rules, as Bill Clinton said, and still have a high-wage middle-skill job—those days are over.

JH: One more follow-up on the gig economy. To the extent that it evolves toward more creative problem-solving tasks, do you see it moving beyond just individuals doing isolated tasks on a contract basis, which is what most people think of when they think of the gig economy? As the focus increases on creativity and lifelong learning, do you see a tendency, perhaps, for these people to come together into more sustained work groups that will work together on these challenging tasks? Or will they just stay isolated individuals?

TF: It makes total sense. Stage 1 is we all go solo, and stage 2 is, some real estate developer comes along and says, "Well, you're all solo, so I might go into the worker space business." Then, somebody's going to come along and say, "Gosh, you all need meals, and you all might need health care advice, and by the way, you might need pension advice." So I think it will all start to adapt around this.

CE: What about the role of companies in terms of fostering lifelong learning? What's your sense of what can companies do to help us make this transition [to workers] who are passionate lifelong learners?

TF: Well, the AT&T model is [one of] the best I've come across. Basically, the CEO shares with the company where the company is going, what world they are living in, and what skills you need to be a lifelong employee at AT&T, then partners with Udacity to create nano-degree courses for each one of those skills. Then the company gives each employee up to $8,000 a year to take those courses, but it says to the employee, "Your responsibility is that you have to take them on your own time." I believe that is the new social contract. "We, the company, with help from government, will create the lifelong learning opportunities, but you, the employee, will have to seize them on your own time." More will be on you.

There are three new social contracts that have to evolve here. Government has to incentivize companies to create these lifelong learning opportunities. Companies have to create the platforms for employees to afford to be able to take these courses. And the employee has to have a new social contract with themselves: "I have to do this on my own time; I have to be more self-motivated." More is on you. That part of the story, I can't change. The day when you could just show up, work hard, and play by the rules, as Bill Clinton said, and still have a high-wage middle-skill job—those days are over.

JH: One of the big themes in your work is this notion of the increasing importance of knowledge flows, and how they help us to learn faster. On the other hand, there's the downside that too much knowledge flow can become overwhelming. So what are the most effective ways you see of participating in knowledge flows so we can learn faster, but at the same time avoid becoming overwhelmed by this avalanche of knowledge?

Give me a young person or employee with a high passion quotient and a high curiosity quotient, high PQ and high CQ, and I'll take them over the person with a high intelligence quotient, IQ, seven days a week.

TF: I would put it in terms of filters. For example, I talk the talk of globalization and technology, but I do not walk the walk. If you are tweeting at me or about me, y'all have a good time. I am not there. I do not look at Twitter. It's a fire hose with too many people who are just throwing stuff up there that I'm not interested in. If I have to learn about the coup, the revolution, or the earthquake three minutes later from CNN, I'm okay with that. And so I am trying to find the right balance of flow and friction. I want to let enough in so that I know what's going on so I can write these books, but not so much that I am so overwhelmed that I'm paralyzed.

I think that's why we need to teach filtering, literally, to our students. There should be Filtering 101, Filtering 102, Filtering 103. How do I filter information so I get enough of it to advance, but not so much that I'm overwhelmed? How do I filter news? The Internet, the mother of all flows, is actually an open sewer of untreated, unfiltered information, and if my employees, my students, and my kids don't have filters built into them to be able to get the best out of flows and cushion the worst, then we're going to have a real problem. So filtering, teaching people how to filter—how to go to three different places to verify the information that used to be in the textbook where you knew it was true, because it was edited and went through all the normal processes—we need to do that. I think we need to be teaching digital civics to every child. You should not be able to get out of elementary school without a class in digital civics on how you talk on the Internet, how you relate to someone on the Internet, and how you filter news on the Internet.

CE: This raises the question of, "What is the role of schools in the work of the future?" It seems that our educational system was modeled to train people for one form of work, and it's not quite clear they're focused on the work of the future.

TF: For me, 95 percent is about teachers and parents, and 5 percent is everything else. I am a journalist today because I had a great journalism teacher in 10th grade at St. Louis Park High School in Minnesota. She inspired me—the only journalism course I've ever taken is her class. Not because I'm that good, but

because she was that good. So great teachers, they can show up anywhere: public school, private school, anywhere, and our job is to simply find and nurture more of them.

At the same time, though, I believe that what happens in all those other 20 or 18 hours of the day when you're out of school, and on weekends, matters more than anything. It's parents who do as little as ask their kid, "What did you learn in school today? How did you do in school today? How was your day in school?" Parents who take an interest and passion in their kid's education and learning. Give me that and I'll make every good teacher great, and I'll make every great teacher outstanding. It's so much about parenting and good values that you nurture at home: love of learning, love of reading. I think we want the public schools, or the charter schools, or whatever, to remediate all the problems of parenting, and there's no teacher who's good enough to do that.

JH: Maybe we can go to another challenge you've already highlighted, which is this notion that if you're training for a job that exists today, or a set of skills that exists today, you're likely to be in trouble. It raises the question of, "Well, okay, so how do you anticipate and get ready for what's next in a way that you can be prepared?"

TF: There's only one way, and I've felt this really is a theme in all my books. You have to teach people to love learning. Some of us are lucky; we were born with it. If you're lucky as a parent, and your kids love to learn, you won the lottery. Some of us have to learn it; others have to have it inspired in them by a great parent, or teacher, or spiritual leader, or president. But there is no more important survival skill than learning to love learning. That's why I've always lived by the formula, which I give in *The World is Flat*, that PQ + CQ will always be greater than IQ. You give me a young person or employee with a high passion quotient and a high curiosity quotient, high PQ and high CQ, and I'll take them over the person with a high intelligence quotient, IQ, seven days a week. PQ + CQ are always greater than IQ.

JH: One of the key themes in *Thank You for Being Late* is the implications of digital technology and Moore's law, and you talk about some of the specific technologies, like robotics and artificial intelligence, that are especially

I think the companies that are doing best are creating what I call STEMpathy jobs—jobs that combine science, technology, engineering, and math with human empathy, the ability to connect with another human being.

relevant to the future of work. I'm wondering if you have some examples or views you can share about what companies are doing well and not so well in terms of integrating this technology into the future workforce. My sense at one level is that they're focused largely on automating work as opposed to augmenting work, and I would be interested in your perspective on that.

TF: I like that distinction you make between automation and augmentation. I think the best companies are doing both, automating wherever they can and augmenting wherever they can, because that's where you're going to get the most efficiencies. I think the companies that are doing best are creating what I call STEMpathy jobs—jobs that combine science, technology, engineering, and math with human empathy, the ability to connect with another human being. When you put those two things together in a manager or in an employee, I think you have the sweet spot of where work has to go.

CE: I've often said I've never met a machine with courage or empathy, so I'm fascinated by your concept of STEMpathy. Please explain a little more what you mean by it.

TF: In terms of planning, and values, and how do I think about the future—you can't automate that. If you think of Watson, who's the best doctor in the age of Watson? It's very different. It's the doctor who can ask Watson the best questions. If Watson's read every article ever written on cancer and no doctor can even think about approaching that, then being able to ask Watson the right question about a patient and then translate that in an empathetic way to that patient—and use Watson not as a substitute, but an augmenter for that doctor's own innate skills—it's in that combination that you're going to get absolutely the best jobs. It goes right down to anyone who's had an elderly parent in an Alzheimer unit, as I have, or even a nursing home. Boy, they know the difference between that caregiver who has both some medical knowledge and the kind of empathy that lets them relate to your parent. And how much more would I pay for that person to be looking after my mom as opposed to the person who doesn't have those skills? I'd pay a lot.

CE: What do you think about this kind of disruption around AI? Do you think society and businesses, and we as individuals, are ready for it?

TF: Probably not, but it's both. I'm not ready for a software program where, if I give it a certain set of views, it will write a column, an opinion column, modeling after my tropes. That's kind of scary to me. But at the same time, I'm a golfer, and I'm a busy person, and you know what I discovered? The hourly weather report. I can now look at the hourly weather report and say, "Oh my goodness, the sun's going to be out from 2 to 4 p.m. in Bethesda. I can work all day when it rains, and then I can do my golf between 2 and 4." It's made me so much more efficient and improved the quality of my life. And I think that applies to all of these systems.

They're just dumb systems, in a sense, even AI, and it's all about the human values that we bring to it.

JH: I recently gave a talk at South by Southwest about robots actually restoring our humanity. In the world of scalable efficiency that we've been operating in, we've defined work as tightly specified, highly standardized tasks. If that's what work is, my proposition is actually that robots are much better at that than human beings are. They don't get distracted, they don't get sick, they don't make mistakes. And if the robots start taking over those tasks at a much more rapid rate, it's going to be a catalyst, I believe, to force us to rethink what work could be for human beings. What are those unique human capabilities that we could tap into?

TF: Dov Seidman and I did a column together that said what you just said in a slightly different way. Dov made the point that we used to work with our hands for many centuries; then we worked with our heads, and now we're going to have to work with our hearts, because there's one thing machines can not, do not, and never will have, and that's a heart. I think we're going from hands to heads to hearts, which is just another way of saying what you just said: "What are the most human capabilities we can tap into?"

JH: You've talked about the notion of companies evolving into platforms. Can you talk a little bit more about what role you see platforms

playing in terms of the future of work and what kind of impact they'll have?

TF: When I look at the companies that are really doing well and that aren't just platforms, they're blending the platform potential of their business—the GE jump ball—with creating a really strong in-house learning innovation environment. That's why I love going to these old companies that are still around—AT&T, GE, Intel, Qualcomm. They all have that in common: that they've found a real way to balance what is new, and the new potential of it, with the strength of still having a company, a brand, and a value set around a certain team of people. Again, I'm so Aristotelian in my thinking. Life is always about the midpoint and moderation. It's never about extremes; it's about finding the balance.

JH: You talk about and actually cited some of our work around the mounting performance pressure that comes with all this acceleration of the forces of change.[3] What do you see as some of the negative consequences or potential negative consequences of that kind of pressure, and how do we reduce the risk of those negative consequences?

TF: Well, I'll take an example from my own business. We have newspapers now that have put up scoreboards in the middle of their newsroom. So people can go, "Let's see, Tom Friedman wrote about Deloitte today. Oh my gosh, look at that; it's going up on Google and trending on Facebook, and trending on Twitter. What was that story you wrote about Deloitte? Oh, it was trashing their CEO, really dishing on her." And the person sitting at the next desk is saying, "Wow, Tom, you made it to the top of the scoreboard trashing the CEO of Deloitte. Wait, it turns out Deloitte's called up and they're complaining about the story. It's not true. Yeah, we'll run a correction tomorrow at the bottom of page 822 underneath the ads." But meanwhile, I'm at the top of the scoreboard. Really bad trend. Now, I'd like to think I've been around long enough so I don't fall prey to that. I hope I don't. I try to write about what's important, not just what will go viral. But if you're a starving journalist or if you just don't care about that, and you just care about "Look how many hits I got," it's a really bad trend. It's going to make us really stupid. Because I'll only be writing about what will scale, and I'll only write about Deloitte's failures, not successes.

CE: Tom, let me be a little personal here. I understand you have two Millennial daughters. I also have a son and daughter who are digital natives. My son, about a month ago, came to me and said, "Mom, I'm afraid I'm not going to get a job someday." I said, "Why?," and he said, "Because a robot's going to do my job." So I did the whole "augmenting humans, not replacing humans" thing, and I said I've never met a machine with empathy, and he said, "All right, I'll just have to learn to be a cobot." I said, "What's a cobot?," and he said, "To coexist with

the robot." So what counsel do you give your daughters that you can share from your perspective with all the research and writing that you've done?

TF: Well, I have five pieces of advice for my daughters. The first is to always think like an immigrant. How does the new immigrant think? New immigrants think, "I just showed up here in Bethesda, and there is no legacy spot waiting for me at the University of Maryland. I better figure out what's going on here, what the opportunities are, and pursue them with more energy, vigor, and more PQ and CQ than anybody else." So my first rule is always think like an immigrant, because we're all new immigrants to the age of accelerations.

Second, always think like an artisan. This was an idea I got from Larry Katz at Harvard. Larry points out that, before mass manufacturing, before factories, work was artisanal. Work was built around artisans, and the artisan made every chair, every table, every lamp, every fork, knife, spoon, plate, glass, pitcher, shoe, dress, suit, underwear, stirrup, saddle—all that was made by an artisan. And what did the best artisans do? They brought so much personal value-add, so much unique extra, to what they did that they carved their initials into their work at the end of the day. So always do your job [in a way that] you bring so much empathy to it, so much unique, personal value-add, that it cannot be automated, digitized, or outsourced, and that you want to carve your initials into it at the end of the day.

Third, always be in beta. I got this idea from Reid Hoffman, co-founder of LinkedIn. Reid likes to say that in Silicon Valley, there's only one four-letter word. It actually does start with an F, but it isn't four letters, and that word is "finished." If you ever think of yourself as a finished product, you're probably finished. Reid's motto is, "Always be in beta." Always be in the state of mind of a piece of software that's about 85 percent done. You throw it over the wall, the community tests it, finds the holes, finds the glitches, they throw it back, you work on it some more, you throw it over the wall again, they test it, and so on. Always think of yourself as if you need to be reengineered, retooled, relearned, retaught constantly. Never think of yourself as "finished"; otherwise you really will be finished.

Fourthly, always remember that PQ + CQ is greater than IQ. Give me a young person with a high passion quotient and a high curiosity quotient and I will take them over a kid with a high intelligence quotient seven days a week. In the age of Google, no one really cares what you know, because the Google machine knows everything. All they care is what you can do with what you know, and I will trust PQ and CQ over IQ over the long term on that.

And lastly, always think like a waitress at Perkins Pancake House in Minneapolis. Perkins is my favorite restaurant; I grew up outside of Minneapolis, and there's a Perkins on Highway 100, France Avenue. I was eating breakfast there with my best friend, Ken Greer, when I

was working on a book back in 2011. I ordered three buttermilk pancakes with scrambled eggs and Ken ordered three buttermilk pancakes with fruit, and the waitress took our order and came back in 15 minutes. She put our two plates down, and all she said to Ken was, "I gave you extra fruit." That's all she said. I gave her a 50 percent tip. Why? Because that waitress didn't control much, but she controlled the fruit ladle, and what was she doing back there in the kitchen? She was thinking entrepreneurially. She was thinking to herself, "You know? I'm going to give this guy an extra dollop of fruit." See what happens? Turns out, he was sitting with a chump like me, and I saw that, and I said, "That's kind of cool. I'm giving you a 50 percent tip." She was thinking entrepreneurially. So my advice to my girls is, "Whatever you do, whether you're in the public sector or the private sector, whether you're on the front lines or a manager, always think entrepreneurially." Always think, "Where can I fork off and start a new company over here, a new business over there?" Because [huge manufacturing companies are] not coming to your town with a 25,000-person factory. That factory is now 2,500 robots and 500 people. So we need three people starting jobs for six, six people starting jobs for twelve, twelve people starting jobs for twenty. That's how we're going to get all those jobs. We need everyone thinking entrepreneurially. ●

Editor's note: Mr. Friedman's participation in this article is solely for educational purposes based on his knowledge of the subject, and the views he expresses are solely his own.

***Cathy Engelbert** is chief executive officer of Deloitte US.*

***John Hagel**, a managing director with Deloitte Consulting LLP, is co-chairman for Deloitte LLP's Center for the Edge.*

Endnotes

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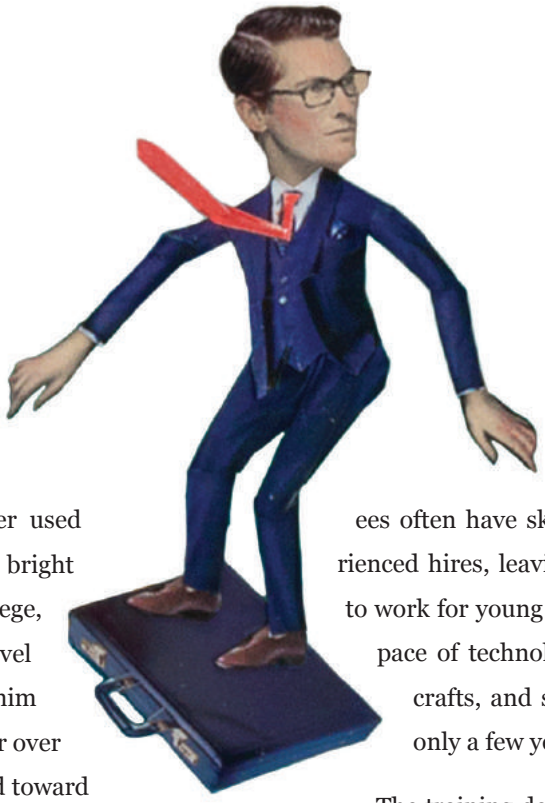
Complimentary article reprint

Catch the wave

The 21st-century career

By Josh Bersin
Illustration by Pushart



NEW MODELS FOR A NEW WORLD

OFFERING employees a rewarding career used to be easy: You'd hire a bright young person out of college, plug him into an entry-level role, and then watch him climb the corporate ladder over the years as he progressed toward retirement. The company could plan for this continuous process—hire people based on their degrees, help them develop slowly and steadily, and expect some to become leaders, some to become specialists, and some to plateau.

Today this model is being shattered. As research suggests, and as I've seen in my own career, the days of a steady, stable career are over. Organizations have become flatter[1] and less ladder-like, making upward progression less common (often replaced by team or project leadership). Young, newly hired employees often have skills not found in experienced hires, leaving many older people to work for young leaders. And the rapid pace of technology makes many jobs, crafts, and skills go out of date in only a few years.[2]

The training department used to offer a stable and well-architected career (I spent my entire first year at IBM as a "trainee," with a 10-year career path clearly laid out). Today, many training departments are struggling to keep up, often pointing us to online courses and programs, telling us that it's our job to "reskill ourselves." And while they try to give us what we need to stay ahead, research shows that they are also falling behind: Employees rate their L&D departments a dismal -8 in net promoter score, lower than almost any product in the consumer landscape.[3]

As technology evolves apace and more of us work part-time, these trends are only accelerating. LinkedIn co-founder Reid Hoffman believes that careers are now simply "tours of duty,"[4] prompting companies to design organizations that assume people will only stay a few years. And data bears this out: 58 percent of companies believe their new employees will stick around less than 10 years.[5] (LinkedIn research shows that, on average, new degree-holders have twice as many jobs in their first five post-college years now as they did in the mid-1980s.[6])

But hold on. The world of careers doesn't have to be so difficult and unforgiving. Organizations *can* adapt their career strategies and help people learn faster and continue to stay engaged. It just takes a rethinking of the problem, and a need to be aware of how jobs, careers, and skills are rapidly changing.

The bottom-line question is this: How can organizations build career models that encourage continuous learning, improve individual mobility, and foster a growth mind-set in every employee, year after year? This is the opportunity for today; companies that figure this out will outperform, out-innovate, and out-execute their peers.[7]

The changing nature of careers

Let's examine what a "career" really is. The traditional idea of a career has three components:

- **A career represents our expertise, our profession, and ultimately our identity.** It defines *who we are* and *what we do*. This form of self-identity makes changing careers dauntingly difficult: What if we switch careers and fail? Then who are we?

- **A career is something that builds over time and endures.** It gives us the opportunity to progress, advance, and continuously feel proud. When we are asked to change our career or path, what happens to all we have learned? Do we throw it all away? Or can we carry it forward?

- **A career gives us financial and psychological rewards.** It makes life meaningful, gives us purpose, and pays us enough to live well. What happens if our career suddenly becomes less valuable, even if we still enjoy it? Should we continue to make less money or jump to a new path?

The changing world of work has disrupted all three elements: expertise, duration, and rewards. And as scary as this may be for employees trying to stay ahead, it's equally disruptive for employers who must try to hire and develop the workforce of today, tomorrow, and five years from now.

Expertise has an ever-shorter shelf life

It used to be that only certain types of jobs—think of computer programmers and IT trou-

The changing world of work has disrupted all three elements of a career: expertise, duration, and rewards.

bleshooters—needed constant training and upskilling. Now, all of us are expected to continuously learn new skills, new tools, and new systems. Just as COBOL programmers had to learn C++ and Java, administrative assistants have switched from typewriters and dictation machines to PCs and voice memos, assembly-line workers have had to learn to operate robots, and designers have moved from sketchpads and clay models to touchscreens and 3D printing.

In technical fields, there is constant pressure to master new technologies or risk becoming instantly obsolete. One of our clients anonymously surveyed its IT department about what skills people wanted to learn, and more than 80 percent said they were desperate to learn tools such as AngularJS (a new open-source programming environment for mobile apps), even though the company was not yet using the technology.[8]

Today even experts find themselves disrupted. Few professions today are hotter than that of a software engineer . . . and yet many foresee automation taking over the work of coding in the near future.[9] Artificial intelligence is doing the rote work of lawyers,[10] simplifying the work of doctors,[11] and changing skilled jobs from truck driver to financial analyst. As we describe later, it's important for each one of us to learn new tools, adapt our skills, and become more multidisciplinary in our expertise.

What this means to employers is simple: Your employees are constantly feeling a need to "keep up." Millennials, for example, rate "learning and development opportunities" as the number-one driver of a "good job."[12] Managers should give people time, opportunity, and coaching to progress; if you don't, people often just look elsewhere.

The idea of a single, long-lasting career is becoming a thing of the past

Remember the 30-year "lifelong career" that companies promoted during the last century? Well, today only 19 percent of companies still have traditional functional career models.[13] Why have so many organizations let multi-decade career models fade away?

First, business structures have changed. The iconic industrial companies of the early 1900s (steel, automobile, energy, and manufacturing)

have outsourced to smaller firms many of their business processes and sales channels, as well as various parts of their value chain. The result has been a steady increase in innovation and profitability, but a dramatic decay in the security of a "company man" career.[14]

When I entered the workforce in 1978 as a fresh engineering graduate from Cornell, I remember dozens of big companies looking for young engineers to train for lifetime careers, each offering job rotation, heavy amounts of training, and seemingly lifelong employment. I actually joined one of these companies—IBM—only to find my career options altered entirely when management launched a massive turnaround. (I decided to move to a smaller, faster-growing company.)

Similar stories can be told in automobile, manufacturing, financial services, retail, hospitality, and many other industries. In 1970, the 25 biggest American corporations employed the equivalent of over 10 percent of the private labor force.[15] Today, many of the largest US employers by number are retailers,[16] and the retail industry alone accounts for more than 10 percent of US employment.[17] In the current economic recovery, the fastest-growing segment of work has been health care, including small and large hospitals, eldercare providers, and various types of personal-care work.[18] However excellent these employers might be, their primary workforce is mid-level labor—service and delivery roles that neither pay as well nor offer the long-term "career professional" advancement that large companies once routinely offered.

This has created opportunities for some workers but has left others behind their parents at the same age. One study found that workers who entered the labor force in the 1980s and 1990s were more than twice as likely to stay in low-wage, dead-end jobs over the next decade compared with similar employees who joined the workforce in the late 1960s and early 1970s (at the high point of the corporate economy).[19] Part of the reason: Big corporations have outsourced many specialized (and highly paid tasks), which can make it harder to "move up" in socioeconomic status.

Driven by opportunism (why stay at a company where advancement opportunities are limited?) and necessity (what else can you do when your job is outsourced?), the practice of switching jobs and companies grew more common, until job-hopping became the norm. People my age, for instance, typically worked for four to five companies during their working lifetime. Today, a college graduate may work for as many companies *in their first 10 years* after graduation.[20]

THE LONGEVITY DIVIDEND: PLANNING FOR A LONGER HORIZON

There's a happy reason for some of the anxiety about unsettled career paths: Human beings—in most countries, that is—are living longer than ever.[21] While babies born in 1900 rarely lived past the age of 50, in most countries the life expectancy of babies born today exceeds 70; research suggests that Millennials will reach an average age of 90.[22]

Governments, anticipating a flood of retirement benefit payouts, are responding by looking to push back workers' standard retirement age.[23] And indeed, with unions in decline and much more rapid job mobility, fewer workers—even in labor-intensive roles—are able to retire after 30 years, forcing people to work longer.[24] This means that young people should expect careers spanning half a century or longer; schools and employers should help prepare and guide people through working lives in which they learn, work, learn, work, and cycle through career stages many times.

I recently met with the senior executive team of a revered, century-old manufacturer that enjoys tremendously high employee retention. As we discussed these issues, the executives decided that they were going to redesign their career strategy around employees working longer—actively encouraging and supporting workers' efforts to continuously reinvent themselves.[25]

SURFING FROM WAVE TO WAVE

ONE way to think about careers today is to consider yourself a surfer: We catch a good wave early in our life; as it crests and falls, we need to look for the next wave. Bersin by Deloitte's research and an examination of data from labor market analytics firm Burning Glass Technologies[26] confirm that while many technical skills are in high demand, they decay in value as more people acquire proficiency in those skills. Graphic designers, for example, are far less valuable than when the Internet was invented: Experts can still earn a good living, but organizations need many fewer experts, since in a sense we have all become designers.

In certain emerging fields, of course, expertise is in high demand, driving commensurate rewards. Organizations need technical people proficient in Hadoop and other big data solutions, for example, as well as experts in hot fields such as cybersecurity. And they pay top dollar for skilled people in these areas. But over the coming years, as the supply of expertise in these areas grows, the fields themselves shift in unforeseen ways (Hadoop experts become experts in other technologies, for example). The experts, then, must look to "surf" to the next wave, unless they're content to settle for steadily declining financial returns.

I suggest that each of us should think about our career as a series of waves from post-education

to pre-retirement: We'll catch a wave and ride it until it crests, and then, as it calms on the beach, we paddle out and catch the next one. In each new wave, we gain new skills and new experiences, retraining and educating ourselves along the way.

Soft skills growing in value: From STEM to STEAM

While many companies have outsourced specialized tasks over the years, big companies still need myriad technical and professional talent. Our research with Burning Glass shows that skills in math, statistics, project management, and logical thinking are now prerequisites for most positions (even those in marketing, finance, and HR). The problem, again: Such technical expertise may soon be outsourced, automated, or commoditized by youth, giving way to new technical roles of which no one has yet dreamed. Already, thousands of people are working as "robotic trainers,"[27] analyzing what self-driving cars do and working to make them smarter; it's a good bet they'll be doing something different a decade from now.

Today, anyone who wants a shot at a well-compensated position should consider developing skills in math, statistics, and logical thinking; comfort with data is increasingly essential. It's safe to say that anyone who lacks a basic understanding of science, technology, engineering, and math—the STEM fields—will likely find limited career options. Managers, mentors, and HR teams should realize this shift and make training and remedial education available to everyone in the company.

That said, STEM no longer tells the whole story of skills in the 21st century. Tasks based on math, science, and engineering are vulnerable to automation, so they should be complemented with soft skills and other strengths as well. In the 1800s, machinists and metalworkers were the computer scientists of today; as automated manufacturing grew and more powerful machines were invented, these "metal-bending" careers often turned into careers developing, operating, and fixing machines. If you learned how to be a draftsman in the 1970s, you likely watched your profession taken over by computer-aided-design software in the 1980s and 1990s. And if you're up to date on statistics and math, you may increasingly find yourself stretching to do programming, analysis, and interpretation of data, since software programs do many of the computations.

While the core need for technical skills remains strong, another theme has entered the job market: the need for people with skills in communication, interpretation, design, and synthetic thinking. In a way, we can think of these as the arts, hence the evolution of education from STEM to STEAM.

What does it mean to add *arts* to STEM? It isn't as simple as taking a few courses in art history or reading Chaucer. The jobs of the future,

driven by the increasing use of technology taking over rote tasks, require social skills complementing more technical abilities.

Think about the job of a salesperson, bank teller, nurse or caregiver, or business leader—all in-demand jobs that draw upon empathy, social skills, communication, and synthetic thinking. When an angry bank customer strides up to a teller window, an AI program lacks the tools to sense the best way to assess and defuse the situation, but a well-trained, empathetic teller can—and that's what makes her invaluable to the bank.

Consider figure 1, developed by Harvard researcher David Deming,[28] showing that some of the best jobs in the future—those in green—are those that draw upon *both technical and social skills*. Yes, developers can program com-

WILL YOU STILL HIRE ME TOMORROW?

In early 2016, our colleagues at Deloitte UK looked at Oxford University's noted study predicting which jobs would disappear over the next 20 years. They mapped these jobs against the O*NET job skills required in both the "disappearing jobs" and the "growing jobs," identifying a set of 40+ "essentially human skills" that are becoming ever more important in the workforce.[29] The findings clearly point in this direction:

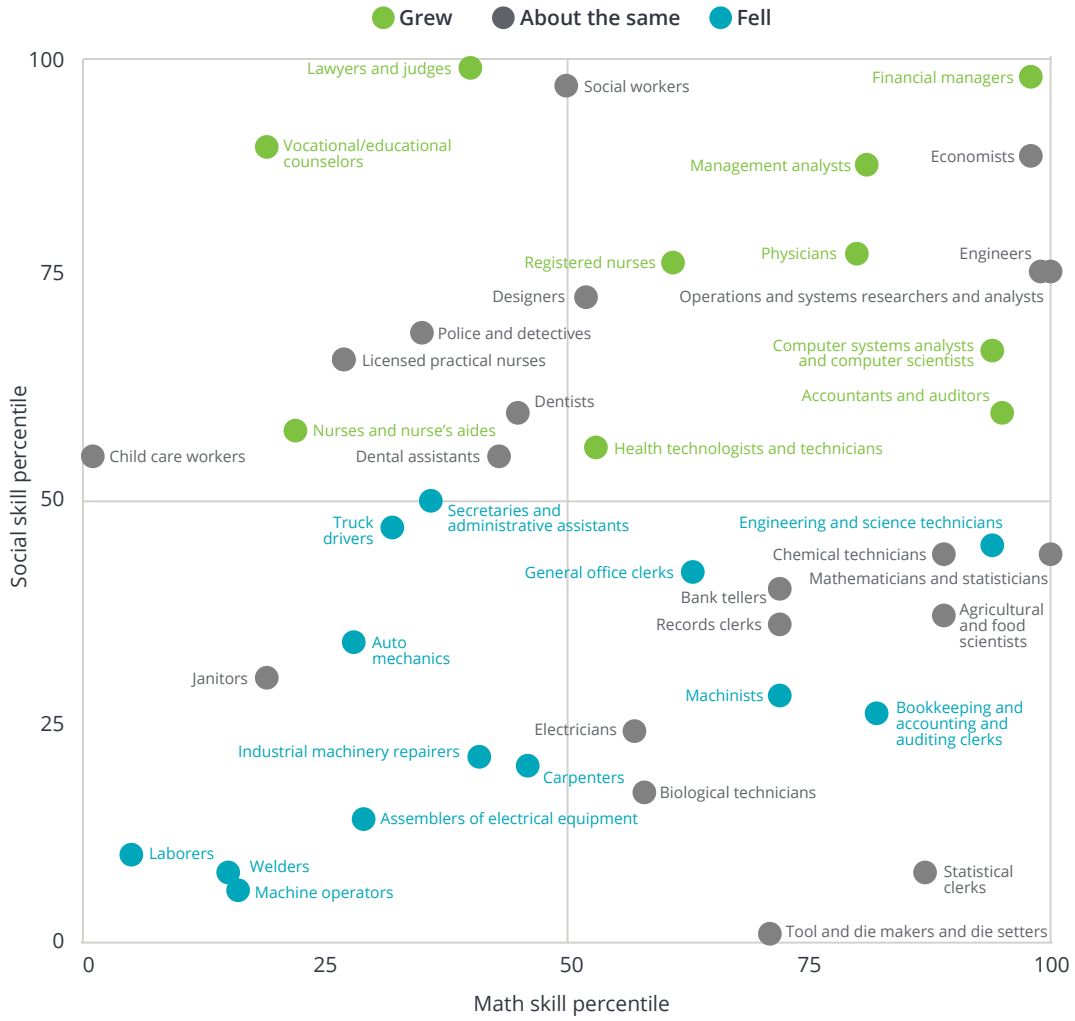
Brains over brawn: In absolute terms, knowledge of specialist STEM subjects is 40 percent more important than the physical abilities of strength, endurance, flexibility, or the ability to manipulate objects.

Social and cognitive skills: A 10 percent increase in cognitive abilities contributes to a 12 percent increase in median hourly earnings.

STEM and STEAM continue to grow: By 2039, math and science knowledge is expected to increase in importance by 8 percent, leading to approximately 4.5 million new STEM-enabled jobs to be created globally, including engineers, scientists, IT and digital professionals, economists, statisticians, and teachers.

This study, one of the largest of its kind, maps skills into various categories across all the "new jobs" and "retiring jobs" to identify what we call the "essential skills" for the future. As this research suggests, skills in communication, critical thinking, visual identity, and reasoning will likely become even more important in the future. For job seekers or career surfers, it is a reminder that our relationship, communication, and thinking skills are critical.

Figure 1. Which jobs require social skills?
Change in share of jobs, 1980–2012



Source: David Deming, Harvard University.

puters to take on rote and information-based tasks, but machines are not yet much good at listening, empathizing, communicating, and convincing.

THE EMERGENCE OF HYBRID JOBS

THE research I've done (including talking with academics, economists, and hiring managers) indicates that wage increases are primarily going to two types of jobs. First, as one might expect, are the hot "technical roles" where skills are (currently) scarce. Second, however, are what we might call "hybrid jobs"—jobs that create whole new job categories by mashing up disciplines.[30] These "renaissance jobs" are those that combine technical expertise (in one or more domains) with expertise in design, project management, or client and customer interaction. They might be titled "experience architect" or "IoT engineer" or "user experience designer" or "security consultant," and they typically involve knowledge of a technical domain, problem-solving capability, project management, and often industry expertise.

Even workers in highly technical fields are increasingly expected to bring softer skills to the table. A 2017 study by Burning Glass, Business–Higher Education Forum, and IBM analyzed new jobs being created in data science and digital marketing and found several important things:[31]

- Organizations are driving a huge increase in demand for analytic roles. Jobs called "data scientist" or "analyst" are growing rapidly, with the overall number of data science and analytics jobs expected to reach 2.7 million annual postings globally by 2020. These jobs are growing in all industries and all developed economies, with particularly high growth in the United Kingdom, Canada, and Australia.

- These jobs are not simply degreed positions—they are jobs that combine math, statistics, critical thinking, and industry expertise, not just skills in data management. Data scientists with industry expertise and experience, for example, command almost 50 percent higher pay than those with pure technical skills.

- These new positions are creating what Burning Glass calls a "new genome" for jobs, combining skills from previous roles into a new role. Whether called "data analysts" or "digital marketing managers" or "HR and people analytics leaders," they combine technical skills with domain and systems expertise in the chosen domain.

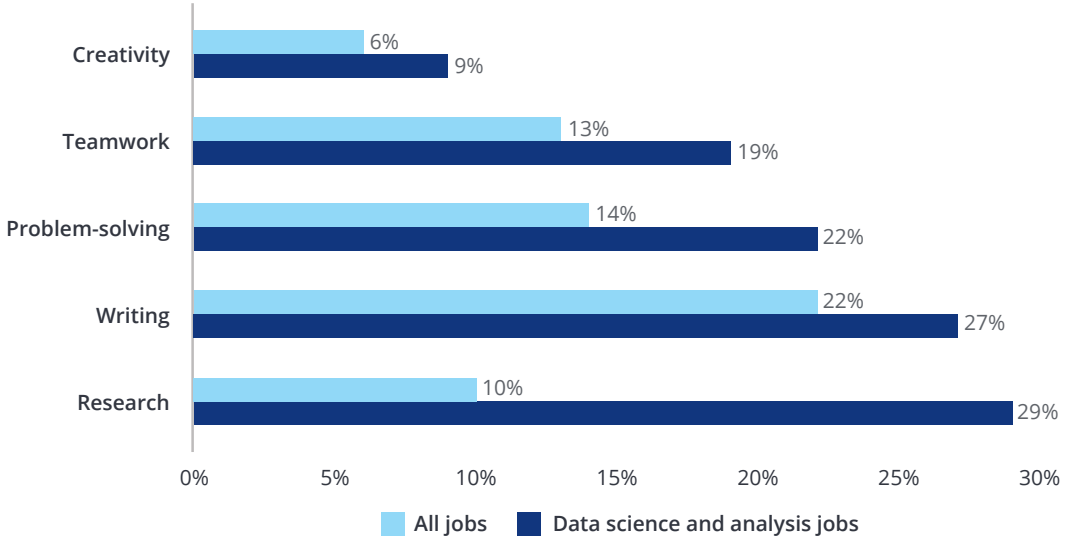
- These roles now require new types of soft skills. Figure 2 shows the types of expertise for which employers are looking in data analysis positions: research skills, writing

skills, and problem-solving skills, along with teamwork and creativity. These are rarely developed through coursework in math or statistics—they're more likely to emerge from a background in English, history, art, or business. Hence the shift from STEM to STEAM.

I remember all too well the early days of the spreadsheet (Multiplan, then Lotus 1-2-3, then Excel) and the fears that these tools would make financial analysts obsolete. Something quite different happened: Yes, analysts had to learn these tools in order to survive, but they then became "super analysts" far more valuable to their employers. This effect, the "machine augmentation of work," can be a positive thing for organizations as well as employees—but only if people take the time to learn how to use the new tools.

Since the Industrial Revolution, workers have had to regularly adjust to working with new machines and systems, but the fast-paced information age makes the hybridization of jobs a never-ending process. Salespeople are now expected to use technological tools such as Salesforce and task management systems; they must understand how to negotiate and forecast, and over time they will likely have to learn how to

Figure 2. Data jobs require more soft skills
Percentage of posts requesting soft skills



Source: Matt Sigelman, "By the numbers: The job market for data science and analytics," Burning Glass Technologies, February 10, 2017.

Figure 3. The evolution of learning and development has been blindingly fast

	1998–2002	2005	2010	2017	2020
	E-learning and blended	Talent management	Continuous learning	Digital learning	Intelligent learning
Formats	Course catalog Online university	Learning path Career track	Video, self-authored Mobile, YouTube	Micro-learning Real-time video Courses everywhere	Intelligent, personalized, machine-driven
Philosophy	Instructional design Kirkpatrick	Blended learning Social learning	70-20-10 taxonomies	Design thinking Learning experience	
Users	Self-study Online learning	Career-focused Lots of topics	Learning on demand Embedded learning	Everyone, all the time, everywhere	
Systems	LMS as e-learning platform	LMS as talent platform	LMS as experience platform	LMS invisible Data-driven, mobile	

Source: Bersin by Deloitte, Deloitte Consulting LLP, High-Impact Learning Organization research, 2017.

take signals from AI-based tools. (Salesforce's new product Einstein is designed to smartly recommend whom to call first.[32]) Managers will likely be increasingly wary of professionals who routinely resist learning new tools until they have no choice.

What is the future role of learning?

If we accept the fact that people need to continuously learn and reskill, how do we make that happen? Do we encourage everyone to go back to school every few years and earn another degree? Not necessarily.

Over the past decade, the training and learning industry has exploded: In 2015 and 2016 alone, investors put more than $1 billion into new US "edtech" companies and ventures.[33] As technologies such as smartphones, embedded video, and YouTube have put high-fidelity learning at people's fingertips, the global marketplace for education, professional skills development, and corporate training has grown to over $400 billion. Individuals can go online to knowledge-sharing sites such as Udemy, courseware sites such as LinkedIn Learning, or technical education sites such as Pluralsight, Skill-soft, and General Assembly and find low-cost courses, lessons, and expert education.

Indeed, many corporate HR teams have found the rapid shift in learning options (figure 3) somewhat disruptive; executives regularly acknowledge to us that their internal learning

and development (L&D) programs lag behind the consumer marketplace. In fact, in our most recent High-Impact Learning Organization survey, employees gave their training departments a low -8 net promoter score, complaining of outdated learning management systems and legacy content.[34]

All of these changes have made L&D a vital part of companies' employment brand and employee experience, and we urge executives to invest in this area. Indeed, innovative companies such as GE, Visa, and IBM are building internal massive open online courses (MOOCs) and entire networks of internally developed content, enabling employees to shop for any training they need, including peer-authored material.[35] Since L&D has become the fastest-growing segment of the HR technology market,[36] we can expect many companies to replace and upgrade their internal learning systems over the next five years.

As a career development tool, the availability of consumer and corporate learning is a godsend: From their desktops, employees can attend MOOCs from firms such as Udacity, Coursera, NovoEd, and edX and take courses from academic and professional experts in a wide range of technical, managerial, and personal-skills topics. Increasingly, too, training firms offer program certificates for those completing courses, indicating new competencies.

SOLUTIONS: THE ROLE OF BUSINESS

As hard as we may try, nothing can reverse the trends toward longer lifetimes, shorter tenure, and the relentless pressure to master new technologies. But organizations can make it easier by adopting an active program to support people's reskilling, re-education, and career development. Our research on this topic shows that it has become a top priority: The 2017 Deloitte *Global Human Capital Trends* report rated L&D the second-biggest issue among business and HR leaders, up from fifth only a year ago, and indicated that 83 percent of companies are reengineering their career programs.

Many organizations, though, have far to go. Some of the leading practices in this area include:

- Opening up learning and content to employees at all levels at no cost (Bank of America now offers a prepaid "credit card" for employees to skill themselves, for example)[37]

- Investing in a large library of training content for employees to use (IBM and GE license courses and content from dozens of companies and have negotiated pay-per-use contracts)[38]

Forward-thinking companies today offer career-planning tools, actively post jobs internally, and encourage and support internal hires and transfers.

- Creating a culture of learning among management: rewarding managers for developing their people, re-engineering the performance management process to focus on development, giving managers incentives for hiring internal candidates versus external candidates (AT&T has focused its entire corporate culture on the continuous reskilling of its employees)[39]

- Creating career paths and self-assessment tools to help employees find new jobs and new career paths within the company (IBM does this)[40]

- Creating L&D programs to enable employees to develop hybrid skills; design thinking, visualization, project management, problem solving, communication, and other soft skills are vitally needed, and standard programs help create career flexibility and a currency of consistent practices

- Offering micro-learning and macro-learning to let people learn quickly as needed (that is, small nuggets of content in the flow of work as well as courses and traditional training)

- Investing in a chief learning officer with an established corporate budget to watch over and shepherd learning solutions in all the various business units and functional areas

- Investing in onboarding programs and transition-management programs that help people move into new roles (Royal Bank of Canada has developed a new-hire program for branch bankers that lasts an entire year, designed for both new employees and transfers)[41]

- Working closely with business leaders on job design and organizational design as technologies automate work, to help realign people, retrain people, and move people into more "essentially human" roles as technology is adopted

Smoothing the waves

Surfing can be scary even on the sunniest of days; when people's livelihoods are at stake, career surfing feels treacherous, especially as waves cast workers off their surfboards again and again. How can we help people navigate and thrive in this new world of careers, while keeping our organizations intact?

The answer is clear: We as organizational leaders should redesign our companies so they offer diverse and continuous opportunities to develop. We should change our reward systems to encourage people to change roles, build technical expertise, and move horizontally for breadth and experience. Does your company reward people for technical expertise and breadth of experience? Or do you promote only people who move up the corporate pyramid?

We should also put resources into coaching, career planning, and career assessment. The old adage that "you manage your own career here" often means people managing themselves right out of the company. Forward-thinking companies today offer career-planning tools, actively post jobs internally, and encourage and support internal hires and transfers.

One of our clients, a large Asian energy company, characterized its job model as so rigidly structured that many people cannot get promoted until someone in the leadership dies or quits. Executives told me, laughing, that the best way for employees to get a better job was to "quit and reapply for a different job."[42] But this is no joke: I find this story true in many large organizations today.

In short, we have to blow up the traditional career model and work to make it easier for people to take the skills they have and use them in new roles within the organization.

No one would suggest that dealing with the career dynamics of the future will be easy, for either employees or employers. It's important to actively redesign our learning organizations, rethink our job models, create more hybrid roles, and throw away our traditional ideas of the up-or-out approach to success.

For companies that handle this well, the payoff can be huge: Our research has found that organizations that define themselves as great places to learn achieve 23 percent greater financial returns, out-innovate their peers, and endure business cycles far better than their contemporaries.[43] With the next big wave just appearing on the horizon, we all need to learn more about surfing.

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ENDNOTES

For references, please see the full article located at: www2.deloitte.com/insights/us/en/focus/technology-and-the-future-of-work/overview.html

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Insights

Forces of change: The Future of Work

A Deloitte series on Future of Work

The future of work signifies the opportunity to evolve our workforces and workplaces. This evolution is being shaped by two powerful forces: the growing adoption of artificial intelligence in the workplace, and the expansion of the workforce to include both on- and off-balance-sheet talent, often referred to as the open talent continuum. These shifts could lead us to reconsider the roles of individuals, organizations, and societies at work. From the individual nine-to-five workday to how entire industries function, work seems to be changing faster than ever. Big shifts threaten to create massive societal and economic disruption unless we look seriously at making the future of work productive and rewarding for everyone. Within this article, we will unpack how technology could transform the workforce and the way people work in the future, while also showing how individuals, organizations, and societies can come together to thrive in the new realities at work.

What is our view of the future of work?

TECHNOLOGICAL advances, demographic shifts, and consumer pulls seem to be fundamentally changing the way people work and the way organizations design jobs and environments. Some see this as a challenge, but it can be an opportunity to reimagine talent models, organizational practices, and business models.

It can be an opportunity to evolve.

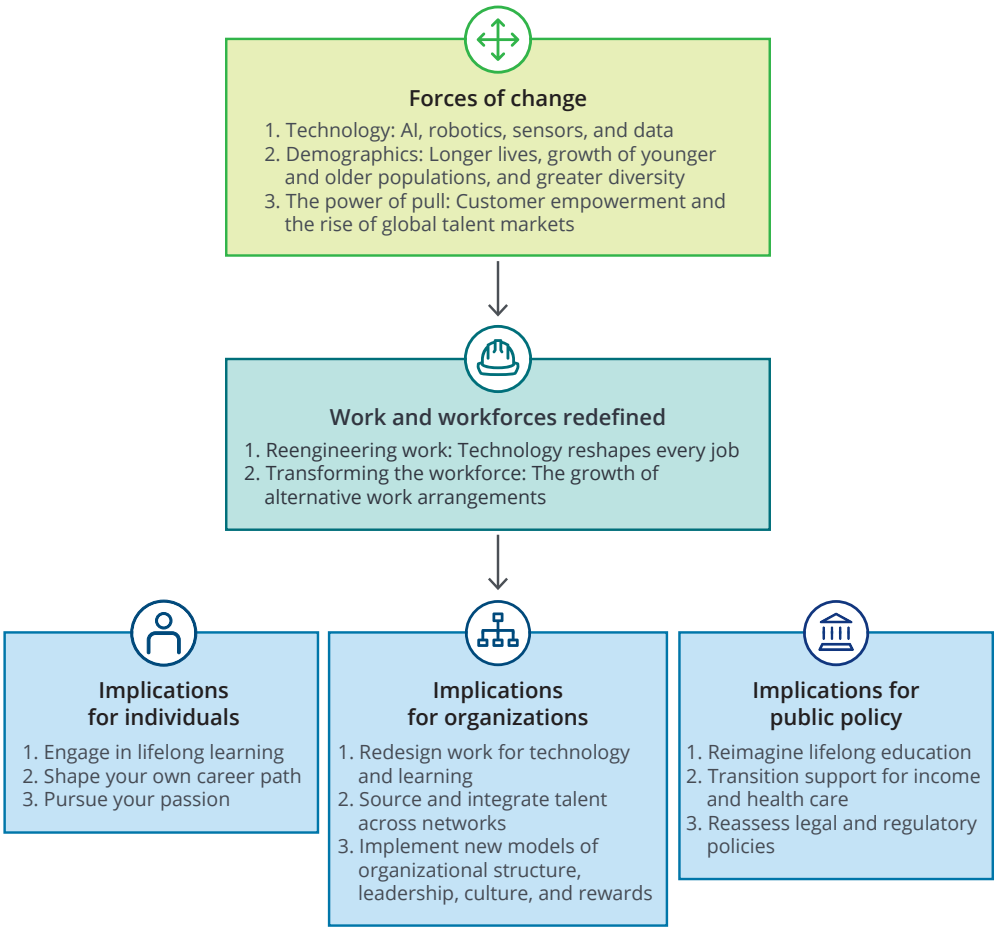
Successfully navigating the coming transformation of work likely requires a refreshed and holistic conversation. We should ask, what will the future workforce look like? How will we redesign jobs and work? Where will work happen? How will businesses operate under the new realities of work? Addressing these questions should start with understanding how these future of work forces—technology, shifting demographics, and empowered global customers—interact, not as separate threads, but as part of an integrated fabric. We should bring together the agendas of individuals, organizations, and societal ecosystems to redefine our workforces and workplaces in ways that not only enhance productivity, but also allow people to thrive in the new realities of work (see figure 1).

The future of work is coming. In some organizations and in parts of many businesses, it is already here. Some are painting a picture out of a science fiction movie, foreseeing doom as robots take over our workplaces. Others suggest that nearly 50 percent of jobs will be automated in the coming years, with human workers made redundant by artificial intelligence and robots.[1]

Will human workers be able to find jobs in the future? We believe so. But for many of us, our jobs will likely change. And in some cases, sooner rather than later.

People expect to be able to find good jobs with greater capacity for creativity and problem-solving: a future of work in which humans and machines work together to help find solutions for many of our organizations' most pressing problems. Human and machine intelligence can be considered different in complementary, rather than conflicting ways. While they might solve the same problems, they often approach these problems from different directions.[2] It won't be humans vs. machines, but about finding the right combination. However, this could pose unique challenges and opportunities for the way we think through today's work and workforces. This new era will likely lead to a new set of rules and the work, workforce, and workplace of tomorrow could be very different to today's. Within this article, we explore how technology could transform the workforce and the way people work in the future, while also showing how individuals, organizations, and societies can come together to thrive in the new realities at work.

Figure 1. A framework for understanding the future of work



Source: Deloitte analysis.

Why does the future of work matter?

THE future of work is all about people—the way they work, where they work, and even who is at work—and the way technology is driving change. However, there is a large relational shift occurring between people and their work. Thomas Friedman describes it:

"Work is being disconnected from jobs, and jobs and work are being disconnected from companies, which are increasingly becoming platforms. A great example of this is what's happening in the cab business. Traditional local cab companies own cars and have employees who have a job; they drive those cars. But, now they're competing with Uber, which owns no cars, has no employees, and just provides a platform of work that brings together ride-needers and ride-providers."[3]

Technology is shifting how we think about the workforce. There are two important changes that seem to be happening in the workforce: one, the worker is moving off campus and off balance sheets, and two, the workforce is aging, more diverse, and educated. While these shifts will likely bring challenges as the workforce transitions, they could evolve workforces to create and capture more value by reinventing work through essentially human learning and discovery.

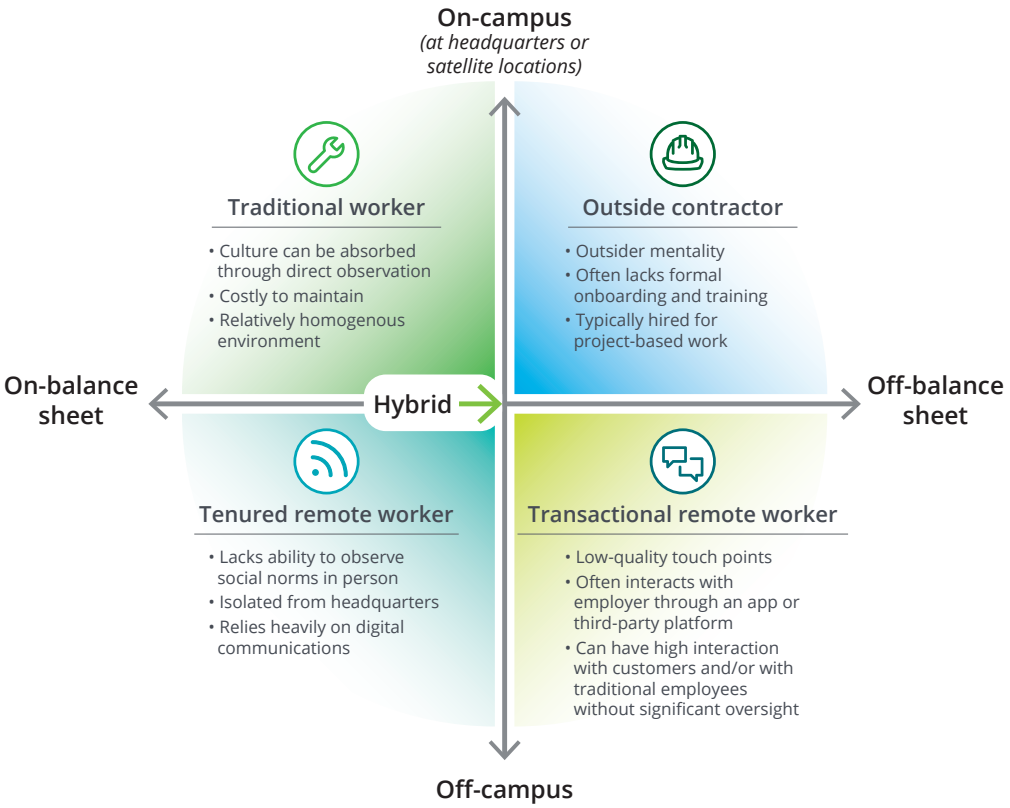
The alternative worker: Off campus and off balance sheets

Technology enables the proximity of work to expand beyond a company's walls and balance sheets. The alternative worker is one of the fastest-growing segments of the workforce. The National Bureau of Economic Research found that between 2005 and 2015, approximately 94 percent of net new employment in the United States occurred within the alternative work arrangement—including everything from gig to freelance and off-balance sheet workers.[4] And this number is anticipated to keep growing. By 2020, an Intuit report predicts that nearly 40 percent of all US workers will be engaged in some sort of alternative work arrangement.[5]

Within our research, we have identified four segments of work arrangements that each possess their own unique needs. Figure 2 shows how the workforce can be segmented along two axes: location—on- vs. off campus, and contract type—on- vs. off balance sheet.[6] Each of these worker segments represents an opportunity to capture value and diversity across organizations. However, each segment also offers a challenge to incorporate broadly into a company's culture.

This new relationship between workers and organizations is likely going to present unique challenges, but also opportunities for both individuals and companies to evolve. As the alternative worker shifts to more rapidly evolving work, the way that work is done is likely to change, moving from short-term transactional remote worker to longer-term relationships that help to accelerate learning and performance improvement. The more creative alternative work becomes, the more likely it will rely on small teams or work groups that would collaborate on different projects over extended periods of time.

Figure 2. The alternative workforce goes to work



Source: Deloitte analysis.

Shifting demographics: Workforce supply changes

The supply of workers is rapidly evolving globally as a result of shifting demographics, enhanced longevity, and increased focus on the inclusion of the marginalized segments of the population. This brings an opportunity for organizations to leverage the most diverse labor market to date.

1. *The US workforce is aging and will continue to age.* 70 is the new 50 in the future of work. While Millennials are the largest generational cohort in the market, we project workers over the age of 65 as the fastest-growing worker segment.
2. *The US workforce is more diverse.* Changing policies are drawing in more diverse populations into organizations. We are seeing a more diverse workforce by gender, ethnicity, culture, religion, and sexual preference and identification than ever before.
3. *Americans continue to become more educated.* More and more young people are going to college, and many workers are increasingly trying to improve their educational background mid-career.

One could say that tomorrow's workers will be much like today's, but only more so. And the challenges, and benefits of an aging, diverse, and educated workforce, many of which are already evident, will likely only grow in the future.[7]

Reengineering work: Technology transforms jobs

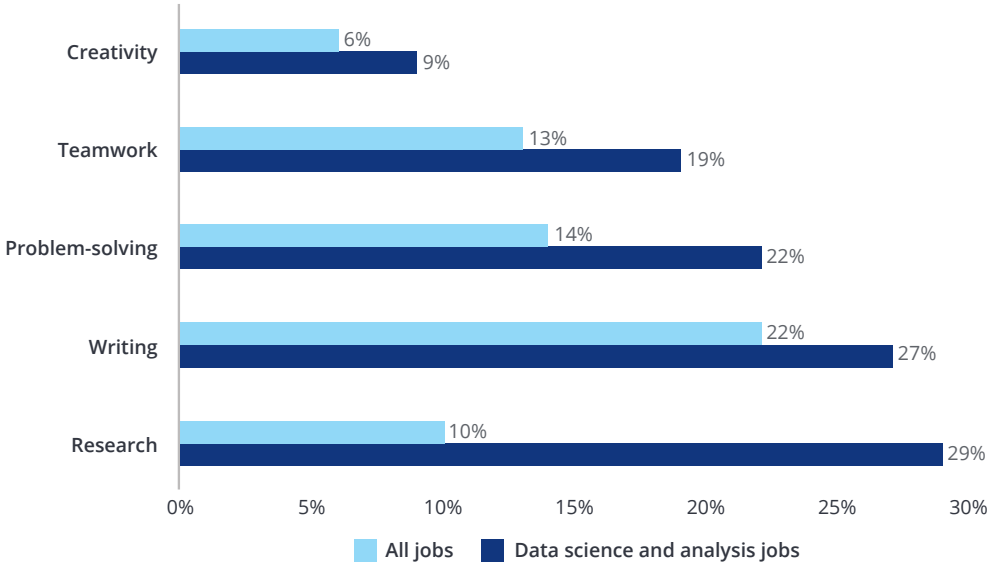
Not only is the worker going off campus and off balance sheets, but the work is also becoming increasingly augmented by technology, which frees up greater capacity for higher-order cognitive tasks. Unpacking the implications that the forces of technology have on the worker is fundamental to organizational leaders seeking to navigate the forces reshaping our understanding of work.

For example, the advent of artificial intelligence (AI) makes it possible—indeed, desirable—to reconceptualize work, not as a set of discrete tasks laid end to end in a predefined process, but as a collaborative problem-solving effort where humans define the problems, machines help find the solutions, and humans verify the acceptability of those solutions.[8] The advancements in augmented reality (AR) allow humans and machines to team together to achieve results neither could alone.[9]

These increasingly sophisticated technologies have caused the nature of work to shift away from relatively routine work environments to ones filled with growing diversity and complexity. In particular, there has been growth in highly cognitive nonroutine work (including professional or managerial work). The economist, Robert Gordon, notes that from 1970 to 2009, highly cognitive nonroutine work grew by 60 percent, while repetitive work declined by 12 percent.[10] While tasks, especially those routine in nature, become automated, there is greater capacity for human creativity, innovation, and problem-solving.

Further research suggests that more than 30 percent of high-paying new jobs will likely be social and "essentially" human in nature.[11] Therefore, we anticipate a movement toward a "STEMpathetic" workforce—one that comingles technical knowledge and cognitive social skills, such as connecting with other people and communicating effectively. Roles in the future will likely continue to require

Figure 3. Data jobs require more soft skills
Percentage of posts requesting soft skills



Source: Matt Sigelman, "By the numbers: The job market for data science and analytics," Burning Glass Technologies, February 10, 2017.

new types of soft skills, even in very technical-centric fields. Figure 3 shows the types of expertise employers are looking for in data analysis positions: research, writing, and problem-solving skills, along with teamwork and creativity. Individuals and organizations who can master both technical and social skill sets could lead the way in the future of work.

The future of work could create more good jobs, if organizational leaders are able to evolve their jobs by crafting them to make the most out of their employees' inherent nature to be social creatures and creative problem-solvers.[12] Artificial intelligence and augmented reality technologies may allow more good jobs to be created as work begins to leverage the essentially human qualities of social and critical skills. This, of course, would require an emphasis on continuous learning and development, which Millennials continue to rate as the No. 1 driver of good jobs.[13] However, gearing up the workforce to take on increasingly complex tasks that leverage social skills would require policy makers, organizations, and individuals to work together to forge the new realities that lie ahead.

The workforce and technology are changing. They are more digital, more technological, and more global. At the same time, business expectations, needs, and demands are evolving faster than ever before. Deloitte is leading our clients into a contingent, crowdsourced, automated, and cognitive-enabled future where the workforce will become increasingly augmented. The Future of Work program is developing and incubating solutions hand in hand with clients around the world, reimagining the future of talent acquisition, workforce planning, professions, and more.

What are the impacts of the future of work?

THE opportunities presented by the future of work allow us to reimagine and evolve our workplaces and workforces. However, doing so requires mandates at the societal, organizational, and individual level.

Implications for policy makers

Reassess policies. In order for individuals and organizations to keep pace with the changes in the future of work, it is necessary for societal institutions to reassess legal and regulatory policies. Governments in particular should consider updating the definitions of employment to account for freelance and gig economy work and the provision of and access to government health, pension, and other social benefits through micropayment programs. In addition, business formation and bankruptcy rules could be updated to make it easier to launch—and exit—a business as an entrepreneur. Policy makers seem to have an interest in both hastening the emergence of new forms of work—the better to raise citizens' overall standard of living—and preparing for the stresses of the transition.[14]

Reimagine lifelong education. It is anticipated that the half-life of skill sets will decrease to five years in the future of work.[15] Individuals embarking upon a 30-year career would have to update and refresh their skills six times throughout their careers. Ecosystems should be ready to rethink through education and establish a framework to help everyone develop their talent more rapidly. This focus on education should extend to marginalized populations and older generations who do not want to or cannot transition out of the workforce. In addition, payment structures and incentives could be designed to support this approach to lifelong education: facilitating access to ongoing education and training throughout a working career that might span 50 years and many different types of work.[16]

Implications for organizations

And so these shifts are not inconsequential; the changing nature of work can throw unique challenges and opportunities in the way of today's organizational leaders. And companies that fail to address these challenges may risk being left with a workforce poorly equipped to drive lasting success.

Redesign work for technology and learning. To take effective advantage of technology, organizations will likely need to redesign work itself, moving beyond process optimization to find ways to enhance machine-human collaboration, drawing out the best of both and expanding across alternative workforces. Organizational leaders should ensure that technology possibilities are connected to both customer and employee needs during work redesign.[17] In addition, organizational leaders would have to find ways to balance what is new (and the new potential of it) with the strength of what a company still has, such as their brand and values.[18]

Rethink through your workforce strategy. It will likely be important for organizational lead-

ers to use data for strategic workforce planning by identifying shifting demographics and the ways in which technology is upending work. Leaders can proactively prepare talent strategies by utilizing talent and workforce planning tools to provide a clearer line of sight into their changing workforce composition. It may be imperative to then utilize these data insights to develop strategies for workforce segments across a broad range of ages and stages in their career.

Implications for individuals

Engage in lifelong learning. In the future of work, individual learning has to become lifelong—without it you are likely to find your skill set obsolete in less than five years. We no longer learn to work, but rather work to learn. As a result, in the new landscape of work, personal success will largely depend on accelerating learning throughout one's lifetime. As a lifelong learning imperative takes hold, we see individuals increasingly focusing on participation in small but diverse work groups that can amplify learning.

Acquire a technology language. In particular, all workers, regardless of occupation, should become fluent in a technology language. "Tech fluency" refers to a baseline level of technology knowledge and proficiency that workers should have to succeed in a business climate in which technology is no longer an enabler of strategy and revenue, but a foundational driver of both.[19] The challenge is that achieving tech fluency, at whatever level, isn't a once-and-done matter of mastering a particular set of knowledge. It typically requires continuous self-directed learning and development at the individual level to ensure technology readiness in the future.

The future of work is unfolding rapidly. Individuals should now set their eyes on longer careers and engage in lifelong learning. Businesses should be prepared to redesign work and refresh their talent models. Ecosystems should look to reassess policies that make it easier for alternative workers and actively provide the infrastructure to make it easier for individuals to access learning and development throughout their careers.

What should you do next?

- **Individuals** should set their sights on longer careers with multiple stages, each involving ongoing training and reskilling.
- **Organizational leaders** should prepare to redesign work and jobs to take advantage of the growing capabilities of machines and the need to retrain and redeploy people to higher-value and more productive and engaging jobs, working alongside smart machines and many types of workers—on and off the balance sheet, in crowds, and around the world.
- **Public institutions** should proactively prepare for educational challenges, including funding for ongoing education, programs to mitigate the transition costs, and updating regulatory frameworks to support new types of work and workers and a more entrepreneurial economy.

Are you ready for the evolution?

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ENDNOTES

For references, please see the full article located at: www2.deloitte.com/insights/us/en/focus/technology-and-the-future-of-work/overview.html

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Decoding millennials in the gig economy

Six trends to watch in alternative work

By Kelly Monahan, Jeff Schwartz, and Tiffany Schleeter

Introduction

A growing body of research points to the growth of the alternative workforce—particularly as it relates to many millennials "opting out" of the traditional workforce. A recent 2017 study reports that overall self-employment is likely to triple to 42 million workers by 2020, with millennials leading the way. The study predicts that 42 percent of all self-employed individuals in the United States are likely to be millennials by 2020.[1] As people consider new forms of employment, many organizations are turning toward the growing alternative workforce segment and seeking to hire more workers off their balance sheets as part of a workforce ecosystem.

How well do we understand what millennial alternative workers generally look like, do, and want? As more organizations begin to leverage this supply

talent, what story does the data tell about millennials working in the alternative workforce? In this article, we examine over a decade of data and research collected on millennials entering and exiting the alternative workforce to identify potentially notable or statistically significant trends over the years. The data appears to point to six emerging and notable trends that should be on the radar of any leader seeking to leverage the millennial alternative workforce:

1. The proportion of women in the millennial alternative workforce is shrinking, possibly because more millennial women than men are going back to school.
2. The proportion of household income millennials receive from alternative work is increasing.
3. Most alternative millennial workers make less than their traditional full-time employed counterparts.
4. Millennial alternative workers are often supported by someone else in their household.
5. Alternative millennial workers are more likely to find jobs in the arts, maintenance, and administrative professions.
6. Alternative millennial workers appear to be more likely to break the rules, have emotional agility, and work hard.

METHODOLOGY AND ALTERNATIVE WORKFORCE SAMPLE

In 1997, the US Bureau of Labor Statistics (BLS) began conducting interviews with individuals living in the United States who were born between 1980 and 1984 (as of 2013, their average age was 31). The study continued to gather detailed information on these individuals through 17 subsequent rounds. We examined data from these interviews beginning in 2003, when the subjects were between ages 19 and 23 (around the time they were most likely to enter the workforce) and ending in 2015, the last round for which data has been released.

The data includes information regarding a person's household and geography; parents, family, and childhood; dating, marriage, and children; health, pregnancy, and fertility; crime and substance use; education, training, and achievement; employment, income, and assets; and attitudes and expectations. In total, more than 70,000 data points have been collected.

The most powerful aspect of this information is its longitudinal nature. In the first round, 8,984 millennial individuals were interviewed, and nearly 80 percent of the sample (7,103 people) were also interviewed in round 17.

For purposes of this article, we defined the *millennial alternative worker* as someone who received a portion of their income reported on US Form 1099 at the end of the year. These workers could have participated in the gig economy or may have started their own small businesses. Approximately 9 percent of the sample reported alternative work income, with alternative workers representing between 8.1 and 10.8 percent of the sample in various years.

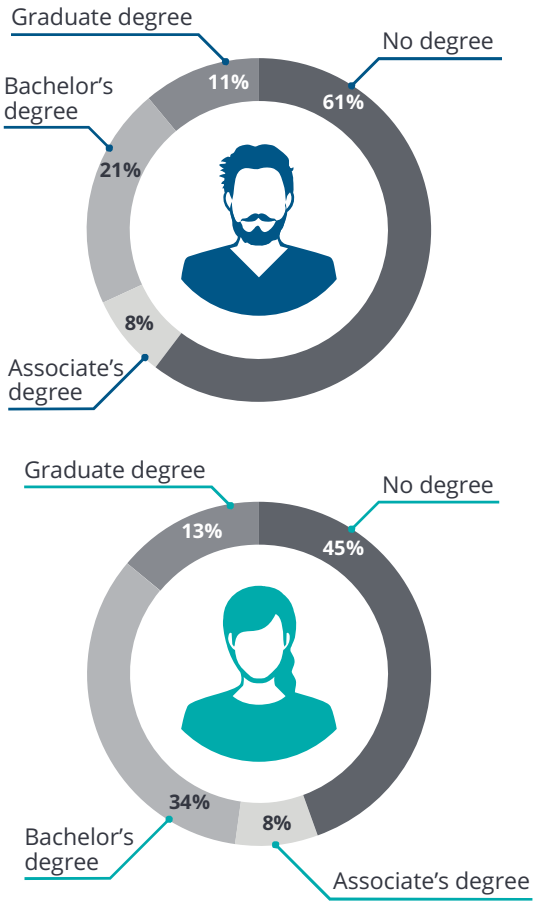
Trend 1: The proportion of women in the millennial alternative workforce is shrinking, possibly because more millennial women than men are going back to school.

The BLS data shows that there is a slightly higher proportion of men than women in the millennial alternative workforce, with the difference in gender representation widening over time. In 2003, the millennial alternative workforce consisted of 52 percent men and 48 percent women; by 2015, that proportion had shifted to 60 percent men and only 40 percent women.

The decreasing percentage of women in the millennial alternative workforce may be because millennial women are more likely than millennial men to pursue secondary education, with some leaving the workforce (alternative or traditional) entirely to do so. Among the general millennial population, more millennial women are entering colleges than millennial men, and the women are completing their degrees faster than men.[2] This trend could also explain our finding that among the millennial alternative workforce, women are more likely to hold a bachelor's degree than men (figure 1).

The decreasing percentage of women in the millennial alternative workforce may be because millennial women are more likely than millennial men to pursue secondary education.

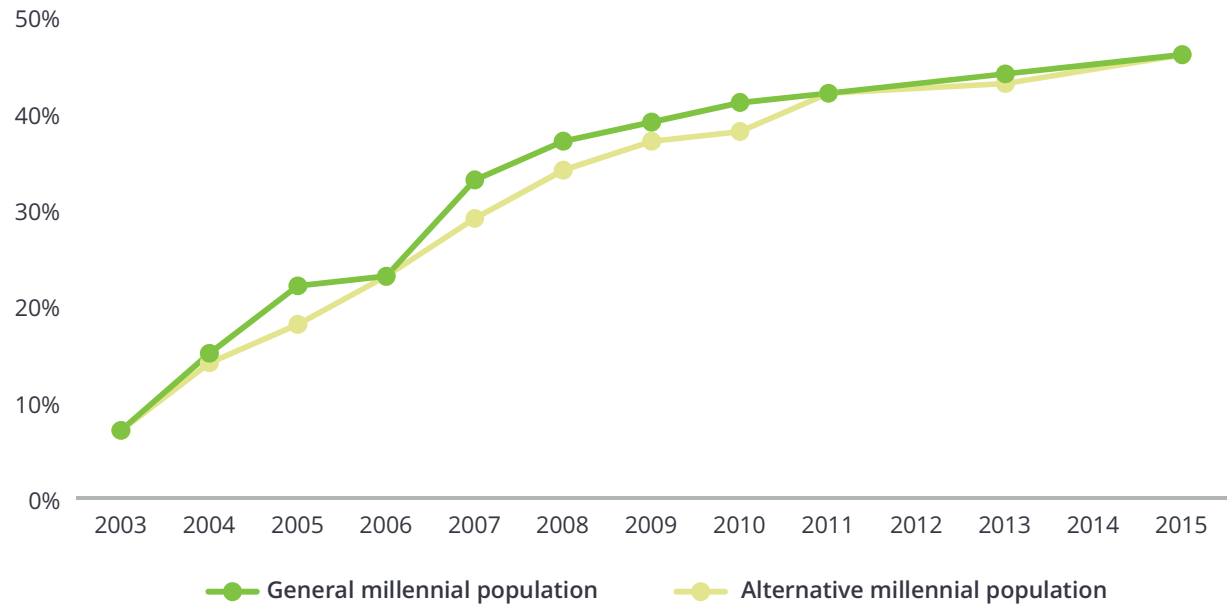
Figure 1. Millennial alternative worker education completion by gender



Source: Deloitte analysis from NLYS97 data.

With nearly 55 percent of the millennial alternative workforce in our study having yet to complete any postsecondary education—a similar proportion as in the overall millennial population—it is evident that, as some millennials make trade-off decisions related to college debt, many are forgoing the completion of additional education after high school and jumping into the labor market. However, when one looks at the trend line (see figure 2), it is also clear that many millennials are completing secondary education at their own pace, with millennial alternative workers doing so slightly later than the general millennial population.

Figure 2. Millennials go back to school



Source: Deloitte analysis from NLYS97 data.

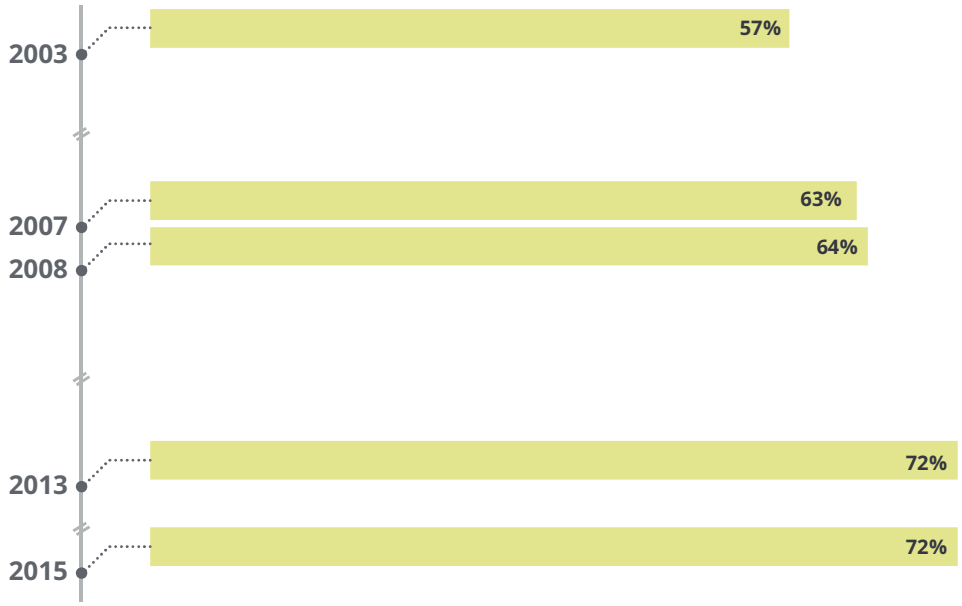
The gender difference in the likelihood of pursuing a college degree, however, is unlikely to be the only reason why there are fewer women than men in the millennial alternative workforce. Some studies indicate that women may be facing higher barriers to entry into the alternative workforce related to a lack of access to networks, financial capital, and underrepresentation at incubators.[3] As more millennials seek out alternative forms of work, ensuring there is broad access to financial capital and networks could be key to ensuring a diverse alternative workforce.

Trend 2: The proportion of individual income millennials receive from alternative work is increasing.

Alternative workforce participation increased sharply in 2007 and 2008, before dipping slightly in later years. One reason for this may be that the recession resulted in millennials facing high barriers to entry into the regular job market; nearly 14 percent of the millennial generational cohort was unemployed during 2007–2008.[4] Another explanation could be the declining number of women millennials reporting income from alternative work. While alternative millennial workforce participation may be slightly decreasing, the amount of overall income received from alternative work is increasing, meaning more participants seem to be going all in when they do participate in alternative worker arrangements (see figure 3).

While alternative millennial workforce participation may be slightly decreasing, the amount of overall income received from alternative work is increasing.

Figure 3. Percentage of individual income received from alternative work



Source: Deloitte analysis from NLYS97 data.

Trend 3: Most alternative millennial workers make less than their traditional full-time employed counterparts.

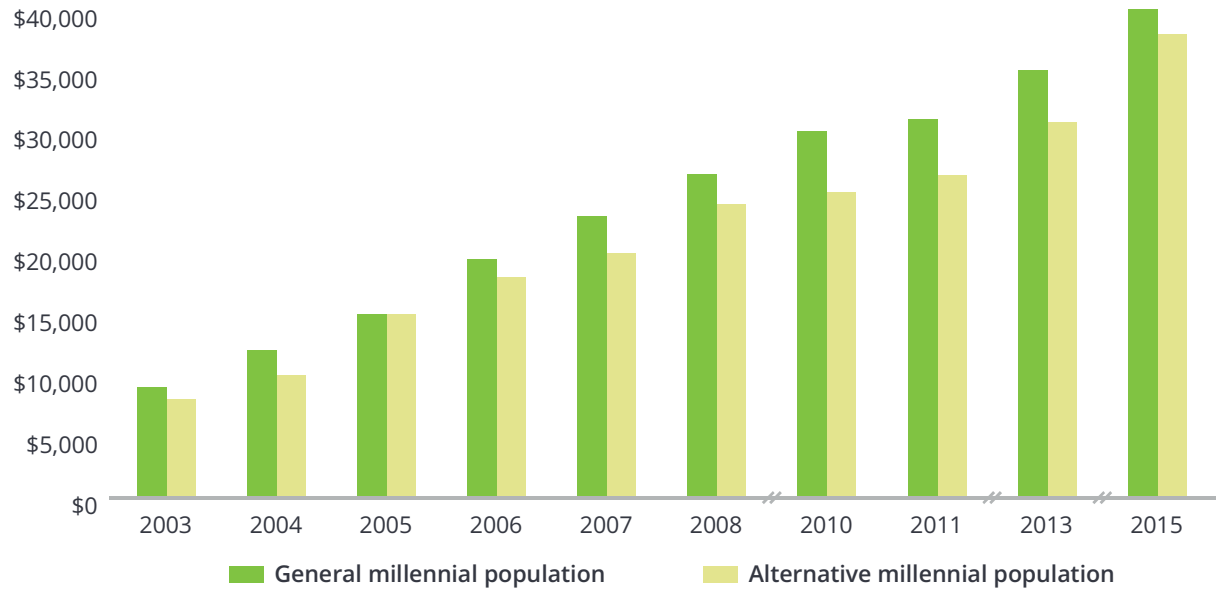
In general, the alternative millennial worker has consistently lagged behind peers in regards to individual income earned (figure 4). There may, however, be a silver lining: In 2015, the millennial alternative worker reported a big jump in earnings moving from median income of $30,720 in 2013 to $38,000 (see figure 4). While the general millennial population also showed a big earnings jump during this period, in percentage terms, it was not as significant as that of those who reported alternative income.

Organizational leaders seeking high quality work from the alternative workforce may be better positioned to recruit contract workers based on fair market pay. A recent study by the Bureau of Labor Statistics found that organizations can save up to 30 percent of labor costs by opting for a contract worker over a full-time one.[5] It may be no surprise then that another study found 43 percent of all alternative workers citing insufficient pay as their reason for leaving the gig economy.[6]

Organizational leaders seeking high quality work from the alternative workforce may be better positioned to recruit contract workers based on fair market pay.

Too often it seems the alternative workforce is seen as a way for organizations to cut costs, rather than create greater value and leverage within their operations. No wonder then that many organizations feel they do not get the same quality of work output from the alternative workforce. Not only does seeing alternative work as a cost-cutting exercise potentially diminish the quality and value workers offer back to the organization, it can also make these workers feel at a disadvantage if they are not

Figure 4. Median individual income reported by the alternative worker



Source: Deloitte analysis from NLYS97 data.

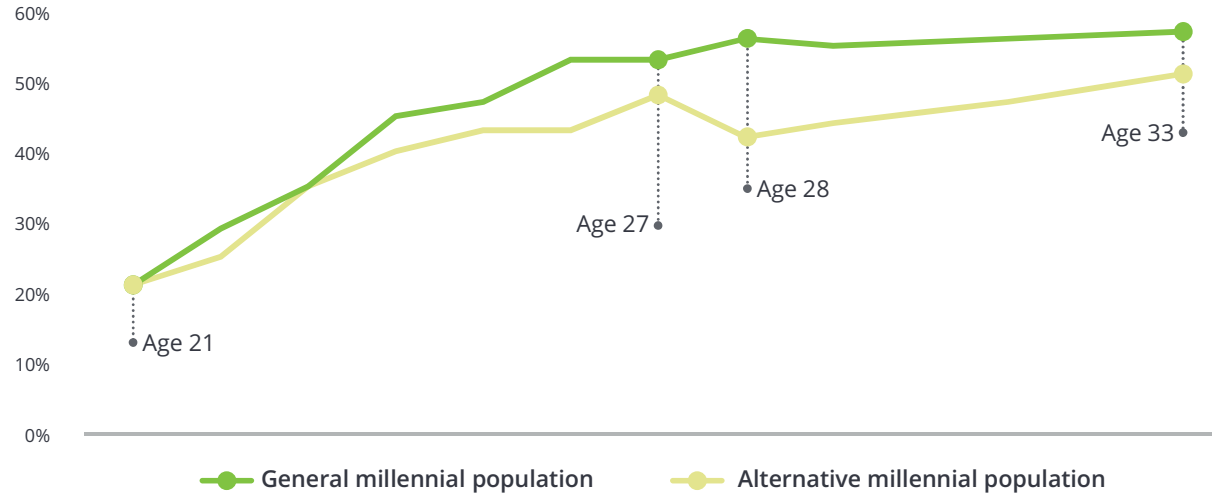
paid fair market wages, as they are not receiving the typical longer-term incentives, such as health benefits, and retirement savings programs that traditional full-time employees receive. We suggest that organizational leaders who leverage the alternative workforce as a creative way to capture untapped value would be better positioned against competitors who leverage alternative workers as a way to cut costs. Doing so will require creative ways to engage the alternative worker in the organization's culture and ensuring fair market pay.[7]

Trend 4: Millennial gig workers are often supported by someone else in their household.

As many millennial alternative workers reported lower earnings compared to the general millennial population, it is no surprise that many are likely to have a household member helping offset daily expenses. Figure 5 shows the percentage of income millennials in the sample contribute to their overall household. For example, the data shows that at 21, millennials in both the general and alternative workforce were contributing approximately 20 percent of the overall household earnings. With age, the general millennial population has trended toward greater household contributions than the alternative worker. In the most recent data collection, at 33, the general millennial population contributed approximately 57 percent to the overall household earnings, while the alternative worker lagged behind at 51 percent.

With age, the general millennial population has trended toward greater household contributions than the alternative worker.

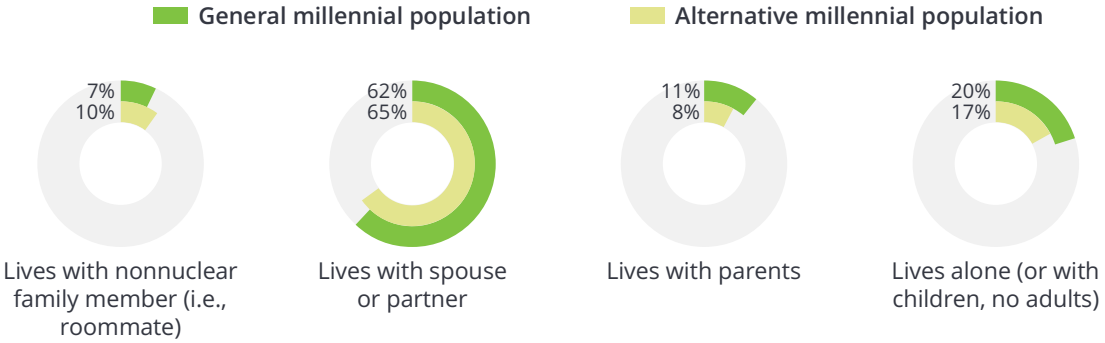
Figure 5. Millennial general and alternative worker income as a percentage of household total earnings



Source: Deloitte analysis from NLYS97 data.

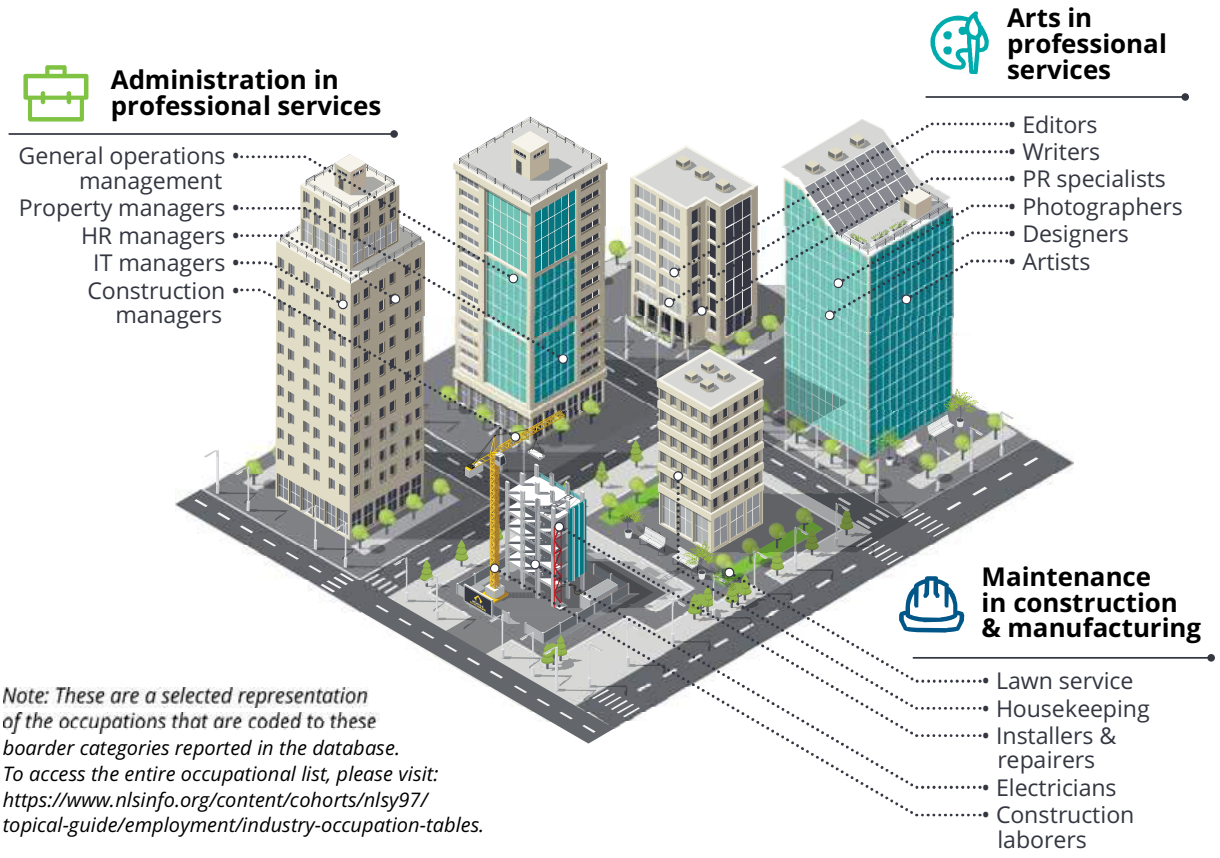
This trend caused us to dig deeper to determine who most alternative workers were likely to live with (figure 6). Data shows that the alternative worker is less likely than the traditional full-time employee to live alone or with a parent. Rather, most of the millennial gig workers live with a spouse or opt for other living arrangements such as a roommate. Most alternative workers are likely to seek support as they build their businesses and may rely on others in their household for doing so.

Figure 6. Millennial alternative worker household status



Source: Deloitte analysis from NLYS97 data.

Figure 7. Occupations that alternative workers seek to find employment



Note: These are a selected representation of the occupations that are coded to these boarder categories reported in the database. To access the entire occupational list, please visit: https://www.nlsinfo.org/content/cohorts/nlsy97/topical-guide/employment/industry-occupation-tables.

Source: Deloitte analysis from NLYS97 data.

Trend 5: Alternative millennial workers are more likely to find jobs in the arts, maintenance, and administrative professions.

Analyzing the data, we found that most alternative workers were finding their work in three distinct categories, in the arts, maintenance, and construction fields as well as administrative roles, and across two sectors, professional services and manufacturing (see figure 7). Likewise, alternative work is declining in administrative support roles, such as receptionists, mail carriers, data entry, and tellers. This is likely explained by the increased use of technology in such areas. The finance, insurance, and real estate industries also saw decreased millennial alternative workers in roles such as banking, insurance, and real estate agents. Alternative workers are likely to continue to hone their craft and become specialized in their chosen field, be it in the arts, manufacturing, or professional services. Organizations should seek to further develop and provide project-based opportunities for these workers to gain greater expertise in their chosen skill.

Trend 6: Millennial gig workers appear more likely to break the rules, have emotional agility, and work hard.

The last trend we explored within the data was possible distinctive personality test traits that emerged as more statistically different than the general millennial population. These traits were derived from the NLYS97 database through the personality questionnaires collected throughout the years that measured millennials' attitudes, expectations, and

beliefs. Within our analyses we found that millennial gig workers are more likely to score higher on the emotional agility, hard worker, and breaking the rules questions than traditional full-time millennial workers.[8] For example, millennial gig workers are more likely than the general millennial population to rate themselves as dependable and self-disciplined, extraverted and enthusiastic, and being open to new experiences. They were also more likely to score higher on questions such as "I do not intend to follow every little rule." As a result, entrepreneurial jobs may have appeared attractive to the millennial alternative worker.

Conclusion

The alternative workforce is likely to only continue to grow each year as organizations seek to expand the reach of their workforce, and individuals, especially millennials, carve out different modes of working.[9] As a result, organizational leaders should look beyond traditional resumes and enterprise employment models to find talent. For example, when considering the alternative workforce, limiting criteria to a college degree could overlook talented workers who are specialized in a particular skill, trade, or experience. Another concern for millennials may be that of income for alternative workers. As mentioned in previous reports, it may take aligning individuals, organizations, and societies in a common direction to help fulfill the changing needs of the worker and workplace.[10] In addition, organizations seeking to not only attract but retrain alternative workers may be wise to take a close look at the financial and learning and development mechanisms that alternative workers may be actively seeking as they continue to grow and expand their businesses.

To learn more, read our research about extending your organization's culture beyond your campus and balance sheets.

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8. See sidebar *Methodology and alternative workforce sample* for more information on the NYLS97, and for further explanation on the personality traits variables collected within the study, please visit https://www.nlsinfo.org/content/cohorts/nlsy97/topical-guide/attitudes.
9. Wang, "The number of Americans working for themselves could triple by 2020."
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