Praise for Human Work

"Jamie Merisotis takes concepts too often used to justify exclusion—credentials, skills, and technology—and repurposes them to provide an ambitious but pragmatic blueprint for dismantling longstanding systemic disparities. *Human Work* recognizes the true ends are not greater efficiencies and revenues, but greater equity and economic mobility. This book is required reading for anyone committed to the future success of our increasingly diverse nation."
—Spencer Overton, *Professor of Law, The George Washington University, and President, The Joint Center for Political and Economic Studies, America's Black Think Tank*

"Jamie Merisotis lays out a powerful argument that the rise of new technologies does not need to accelerate inequality. In fact, through the stories of workers, he shows that people, no matter their starting point, bring critical human attributes that make work personally meaningful and valuable to modern society. This book is a timely blueprint for us all."
—Amy Liu, *Vice President, Brookings Institution, and Co-Founder and Director of Brookings's Metropolitan Policy Program*

"Jamie Merisotis provides a fresh, timely, and relevant analysis of the complexities of human work as the world transitions into an era of uncertainty. Jamie has a unique capacity to combine deep and well-informed analysis with interesting anecdotes and observations. A must read for those committed to building a better future."
—Francisco Marmolejo, *Education Advisor, Qatar Foundation for Education, Health, and Community Development, and Former Global Tertiary Education Lead with the World Bank*

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For my parents, Peter and Diana Merisotis, who taught me that the most important part of work is not what you earn, but what you achieve.

Prologue

"Work is a good thing for man—a good thing for his humanity—because through work man not only transforms nature, adapting it to his own needs, but he also achieves fulfilment as a human being and indeed, in a sense, becomes 'more a human being.'"

—Pope John Paul II, Laborum Exercens (On Human Work), 1981[1]

An old saying about music goes, "Writing about music is like dancing about architecture."[2] I've felt this way a lot over the years as I've tried to write about the world of work and how we prepare people for work through learning. Much like "dancing about architecture," I wonder if writing about something as complex and nuanced as work is an almost absurd exercise. After all, billions of people around the world work, and they do so in as many ways as musicians make music.

But I continue to write about work and the development of human talent necessary to accomplish this work for a fundamental reason. Work matters. People work not only because it helps them economically but also because it offers them social mobility, personal satisfaction, and a range of other rewards that are almost impossible to describe. The technology innovator and investor Roy Bahat may have summed it up best when he said most people work not only for stability—to make money, to have a comfortable life—but for dignity. "You're part of something greater than yourself, and it connects to

some broader whole."[3]

The existential threats the world faces—pandemics, global warming, and challenges to free societies—serve to remind us of our shared humanity, our desire to build and maintain relationships, and the importance of work in our lives. The emergence of COVID-19 as a public health nightmare showcased the perseverance of people who are prepared for work in an uncertain future as it underscored the need to develop coordinated approaches for readying everyone.

Work is changing in unprecedented ways as technology and artificial intelligence take over more of the tasks people used to do. The robots might or might not be coming to take our jobs, but it's clear that society is being thrust into a new era of human work: the work only humans can do in the age of smart machines. Human workers will do more than make money to support themselves throughout the rest of their lives. They will be learning, earning, and serving during the course of their lifetimes, participating in a virtuous cycle that expands human potential and allows all of us to make a difference. We'll need to prepare for this new era by developing our human capacities such as compassion, critical thinking, ethics, and interpersonal communication —in college, at work, and in our daily lives. This means we need new approaches to formal and informal learning after high school that intentionally develop human traits, while also expanding opportunities for service so people can gain greater meaning and satisfaction from life.

In my 2015 book, *America Needs Talent*, I suggested the acquisition and development of talent will drive America's future prosperity. By "talent" I mean not simply innate ability, such as being able to play a sonata or score a penalty kick, but more broadly the combination of knowledge, skills, abilities, and other capacities that are honed through learning and experience in ways that not only improve individuals, but advance society in general. Evidence from the past few years shows this talent imperative exists globally. Data from the Organisation for Economic Co-operation and Development (OECD) and individual countries show demand for talent developed through formal learning has increased more rapidly than expected. The future of work in a technology-mediated world will create even greater demands for this

more fully developed talent.

This book, however, is not titled *The World Needs Talent* or *America Needs More Talent*. In the years since my last book was published, it's become apparent the dramatic changes in work are accelerating. For one thing, work is no longer synonymous with "job"—performing tasks that employers will compensate us for with wages, benefits, and professional advancement within a firm—because many people who are working are no longer in jobs. They are contractors, gig workers, people who do multiple tasks—sometimes quite different ones—to earn money. And they are blending their interests and abilities in ways we have not seen before.

To be sure, some of the changing nature of work is driven by corporate and employer demands, at times aimed less at meeting the needs of workers and more on driving results and profit. While this issue and its consequences are important, workers themselves also are staking claims to their own work futures. Rather than be defined by a job, people increasingly are defining themselves by their ability to do various kinds of work, and by their talent. And talent can be applied wherever it's needed and useful—to make a living, certainly, but also in service to others. We live in a world where many workers say jobs no longer offer the sense of purpose and meaning they once did. Survey research from Gallup shows that fewer than one-third of workers feel engaged with their jobs.[4] Yet most workers say that having real meaning in their work is essential to happiness and life satisfaction.

The social consequences of the loss of purpose and meaning through work have been greater isolation and loneliness and less social cohesion, a trend that has accelerated since political scientist Robert D. Putnam described it in his groundbreaking book *Bowling Alone* two decades ago. Indeed, Amy Goldman, CEO of GHR Foundation in Minneapolis, an innovative philanthropy reimagining what's possible in service to people and their limit less potential for good, told me she fears this trend may be indicative of an even deeper social dilemma. "The problem isn't simply that we are bowling alone," Goldman said. "It's that we aren't bowling at all."

But a talent-based world suggests an alternative in which people apply their own unique talents not only to provide for themselves and

their families, but also to contribute to their communities and work toward a stronger society.

Now the age of smart machines is upon us, and the application of artificial intelligence to work—especially the repetitive tasks almost all workers do to a greater or lesser extent—will put more pressure on traditional job functions. Human work is what people must be prepared to do. At the same time, smart technology is allowing people to become passive consumers of entertainment and information, further contributing to the social isolation the elimination of millions of jobs has caused. The only possible response is to develop talent at a scale that has never been attempted.

By its nature, technology's effects are global. Unlike raw materials and industrial products, information and data move instantaneously throughout the world at virtually no cost. Their only barriers are political, and even those are harder to enforce. In the knowledge economy, a major factor driving the renegotiation of trade agreements, including the North American Free Trade Agreement and the global agreements negotiated through the World Trade Organization, is the need to reduce barriers to services and not just goods. Whether this globalization of knowledge and skills will be beneficial to individuals and nations depends on their response to it.

The economic imperative to increase talent is inextricably connected to individual well-being, to quality of life, and to the stability of democratic systems and nations. This new talent imperative means our education systems, many of which are highly localized, will need to be connected to broader efforts to match learning needs with the changing structures of work, society, and the economy.

Readers will find what follows is not the typical public policy–laden argument that is my signature. Instead, I tell the stories about today's workers and strive to speak more broadly to the issue of human work by arguing:

- Work brings shape and meaning to our lives and is not just about a job.

- As artificial intelligence ultimately leads to the automation of virtually all tasks that are repetitive or can be reduced to an

algorithm, work does not go away but is transformed into the work of the future: *human work*—the work only people can do.

- Human work blends human traits such as compassion, empathy, and ethics with our developed human capabilities such as critical analysis, interpersonal communication, and creativity.

- We urgently need a large-scale, continuous system for developing and deploying quality learning that will prepare people for human work and life in this new age of smart machines. Combined with opportunities for serving others that enhance and magnify this learning, this new system will create a virtuous cycle of earning, learning, and serving others.

- The economy is rapidly becoming people-centered, which demands new and different systems for employment and learning. Both individuals and the economy depend on people developing their abilities throughout their lives and being able to match them with needs in the economy and society. This requires that everyone—employers, educators, and workers—speak the same language about what work requires and what they know and can do. In other words, the worlds of work and learning are merging into a single system based on continuous learning and credentials whose meanings are clear and transparent.

- It's not just the work of the future that requires us to develop our abilities for human work. The abilities and capabilities needed for human work are the same ones necessary to assure a more equal and just society governed through democracy.

People cannot and should not compete with machines for work. We can't prepare people for human work by trying to make them more like machines. But I also don't believe machines are becoming smarter than humans or that we're evolving into a new hybrid species—what the novelist and futurist Arthur C. Clarke called "robo sapiens."

Instead, people need to focus on what makes us different from machines by developing our knowledge, skills, and abilities through a learning system that puts human capabilities and values first. Just as each of us needs to up our own game, other actors in the human work ecosystem also must do better.

Some people will no doubt argue dissolving the lines among earning, learning, and serving will be hard because existing institutions are committed to the established order. This is certainly true, as we've seen efforts to create change in each of these areas resisted by forces internal and external. But it's also true that human development has advanced to a point where we cannot have a "learning phase," a "serving phase," and an "earning phase" without significant disruption. Witness the difficulty of the generations of workers who were engaged in hands-on manufacturing processes, such as making automobiles or producing consumer goods, and how, after the Great Recession of 2008–10, those jobs were obliterated at an accelerated pace.

We now know that, unlike in previous times when many jobs would return after a recession, these jobs won't come back. "Retraining" an individual who has been ejected from an entire line of work—a line of work the person's parents and grandparents also may have performed —is a massive challenge. Though we cannot give up on the retraining process, it's clear many workers are on the cutting edge of a new reality: work and learning must exist side by side, enhanced and enriched by service to others, with a sort of ratcheting-up process over time to higher levels of talent as work continues to evolve. People aren't retrained once, but instead many times during the course of their working lives.

My efforts to contribute to the thinking on this topic may at times feel as if I am trying to dance about the architecture of this new world of human work. But it's worth trying, because in the end, this new human work ecosystem will serve a noble cause—the development of human potential to do work that makes a difference for individuals and society.

1

How Work Is Being Transformed

"So often in life, things that you regard as an impediment turn out to be great good fortune."

—Ruth Bader Ginsburg[1]

Work is changing in unprecedented ways as technology and artificial intelligence take over more of the tasks people used to do. It's not simply that smart machines are doing things people cannot or will not do. It's that they are doing things *with* people to help people do what they do, as humans, better.

This is the lesson Joel Lewis learned as an assembly line worker in the American Midwest. Lewis's story is not uncommon when it comes to manufacturing jobs and robots. But unlike a lot of what's published about how robots are affecting work, his experience is not about robots replacing human workers even as robots keep getting smarter.

Lewis began working at Cummins Inc. on an assembly line, putting in ten-hour shifts stuffing pistons into diesel engines for Dodge Ram trucks. Twenty-two years later, he has seen the assembly process at the

Indiana-based manufacturer of power generation and diesel engine products transformed by process innovation and new technology.

"I see change as a good thing," Lewis said. "We need to be able to work smarter, not harder."

Lewis has worked in a variety of assembly and testing roles at Cummins in plants in Columbus, Indiana, the company's corporate home, and in Seymour, about a half hour south of Columbus on Interstate 65. And he's had a lot of coworkers, including some new "colleagues" in recent years: the company calls them collaborative robots, or "cobots." They are smart machines made possible by advances in sensor technology and artificial intelligence that allow robots and human workers to share the same space—literally working side by side.

Cummins had deployed cobots in fourteen of its plants by the fall of 2019, with the objective of having the machines in nineteen factories by the end of that year. Cummins's intent is simple—to make life easier for human workers, not to get rid of them. "The whole idea is to have the robot work collaboratively with the human worker," said Elizabeth Hoegeman, the company's executive director of manufacturing engineering. The cobot, she said, is "working in the same workspace and doing things that are less appetizing to the worker."

For example, the cobot can perform any type of labor that offers ergonomic challenges, such as having a worker bend over repeatedly to pick up a box. Machines can also do work that might expose a human to potentially harmful chemicals. "Your only limitation is your imagination" when it comes to designing roles for the cobots, Hoegeman said.

Cummins consults with its factory workers to define roles for the cobots. Sometimes the workers offer suggestions for how manufacturing processes can be improved, and other times the comments are more personal, Hoegeman said. "One worker might say, 'If I don't go home with back pain, I'm happy.'" The human workers help the machines learn their functions. By taking over dull-and-dangerous repetitive tasks, cobots allow human workers to concentrate on the higher-level and more creative elements of the work.[2]

As his workplace has changed, Lewis, now in his late 40s, has gone through several phases of training and retraining. And he's also trained other workers. He said many workers are initially intimidated by the changes, but they can be persuaded the changes are worthwhile if they produce benefits for the workers.

Does Work Have a Future?

"Joel Lewis and the Cobots" sounds a bit like an ominous science fiction novel. But does Joel Lewis and his experience represent the end of work as we know it, or a new beginning?

I can't say I have read everything that's been written about the future of work, but I've read a lot.[3] It's hard not to—the topic continues to fascinate journalists, futurists, and even philosophers.[4] While the topic covers a lot of territory, many if not most of these articles and books focus on the effects technology is having on all types of jobs—not just in manufacturing—and how artificial intelligence will eliminate many of these jobs and dramatically change the rest in the near future.

Technology's advancement and the exponentially increasing capacity of computing technology have been well documented. This pace is likely to continue or even accelerate. In 2019, Google reported a true breakthrough in computing capacity using a quantum computer.[5] The speed associated with quantum computing is vital to the success of machine learning and artificial intelligence capabilities.

Artificial intelligence—AI—is indeed different from the technologies that constantly transform our society and economy. Throughout human history, from the most primitive tool to the most complex industrial robots, technology has extended the reach of what people can do. As technology advances, it has taken over countless tasks people have previously performed—just as it has done at Cummins. It always has and always will. Quantum computing is just the latest example of how technology can alter the pace of tasks in ways that were inconceivable even in the recent past.

But AI represents something new. As the name implies, AI is about thinking—the most human of activities. The automation of thinking, in

the opinion of many, will change our economy and society as much as any technological shift humanity has experienced. Klaus Schwab, the economist and World Economic Forum founder, calls the period we are entering the Fourth Industrial Revolution and predicts that, as with revolutions that came before, it will disrupt work and employment for most people around the globe.[6]

Many reports about the future of work focus on the idea that vast numbers of jobs will disappear soon because of AI. Here are several of the more breathless claims:

- "Half of all U.S. jobs could be eliminated."[7]
- "Accountants have a 95% chance of losing their jobs."[8]
- "Automation threatens 800 million jobs."[9]
- Or perhaps the most extreme view: "[The claim that 99% of all jobs will be eliminated] may seem bold, and yet it's all but certain."[10]
- Even actor Martin Freeman says, "CGI in films is so advanced actors could soon be 'rubbed out.'"[11]

I could go on. The most reliable headline about the future of work is that it will include the loss of many jobs, and no one's job is safe. Indeed, some people who study the future of work have concluded we must prepare ourselves for a future *without* work, in which a universal basic income replaces employment and people do something with their lives other than work.[12]

I believe the preoccupation with job loss in much of the writing about the future of work is misplaced. These stories spin the (not very compelling) tale of a zero-sum economy. Much more complex outcomes are likely than simply "truck driving will disappear" or "everyone needs to learn how to code." Those oversimplifications mask the broader patterns at play.

No one knows how many jobs will be lost to AI. A 2018 *MIT Technology Review* analysis of all major studies about job loss and creation, from sources ranging from global consulting giant McKinsey & Company to the OECD and the Bank of England, determined "we have no idea how many jobs will actually be lost in the march of technological progress."[13] So trying to keep up with the guessing game seems to me to be largely a waste of time and effort.

Labor economists have studied the likelihood of different jobs disappearing as a result of AI and automation, and their results are revealing.[14] Job loss is not the whole story. Technology has always created jobs even as it destroys them, and in the past it has tended to create more jobs than it eliminates.[15] Technology has caused some jobs to disappear or be transformed in ways that demand new and more advanced skills, but we also know technology has created millions of new jobs for people with the requisite knowledge and skills —particularly in knowledge-intensive sectors. There is no reason to believe it will be any different this time.

The Future of Work or the Work of the Future?

Perhaps it would be better if we thought less about the future of work and more about the work of the future. In this sense, it's not helpful or correct to frame the issue as job loss. It's really about job *change* and *displacement* and how we prepare people for an inevitable future in which they need to be more flexible, adaptable, and prepared for whatever opportunities present themselves. What's more important than whether a particular job will go away is that everyone will see jobs changed in some way by technology and will need additional learning to take advantage of the opportunities for work that inevitably will be created.

Take the financial services sector. With AI and automation inexorably replacing human tasks when it comes to data analysis, many people believe "machines are becoming a threat to warm-blooded number crunchers worldwide," according to a 2019 Bloomberg analysis.[16] But job-search companies report many of the

same banks and investment houses in which smart machines have supplanted human data analysts are now actively seeking people with different skills to develop stronger information systems, do ever more sophisticated data analyses, and, in effect, manage the robots. At these organizations, data scientists are in high demand.

Seth Jayson, senior analyst at the financial insights firm The Motley Fool, makes the point clearly. "Big companies in the U.S. are actually looking for liberal arts type of graduates because they want people who have a broader background than just a narrow set of skills that you might get out of finance or something else," Jayson said on a 2019 podcast. "And you can always move into the finance area from other fields. I mean, look at me. I was an art history major."[17]

Another, more concrete example of how jobs are being transformed is that of bricklayers. (Pardon the pun.) A new robotic bricklayer can lay three times the number of bricks as a skilled human worker, and, as some articles about this smart machine note, it doesn't stop for water breaks or join a labor union. But even the inventor of the robotic bricklayer says its purpose is to make better use of human workers and not replace them.[18] Bricklayers are still needed to set up and guide the machine, read blueprints, and do the more complex or tricky parts of the job, including tasks that require creative solutions.[19] The same dynamic is playing out in job after job across the world economy.

Tasks, Skills, and the Future of Work

An extensive Vanguard Research study of the forces at play is revealing.[20] Rather than focus on jobs, the researchers looked at the underlying tasks making up jobs in the top hundred occupations in the United States and classified them as basic (requiring few skills and little or no training), repetitive, or "uniquely human." The latter category includes the kind of tasks I am talking about—those requiring "an adaptability to situation and circumstance that can't be codified." This is human work that smart machines can assist with but can't take over.

Unsurprisingly, jobs made up primarily of tasks that fall into the second category, repetitive tasks, are at the greatest risk of automation.

What is more interesting in the research is that the composition of tasks in occupations has changed dramatically in recent years, with a rapid increase in uniquely human tasks. A good example is the occupation of photographer, which has shifted away from repetitive technical skills such as processing film to tasks only humans can do, such as "thinking creatively" and "establishing and maintaining interpersonal relationships." This shift has been dramatic and rapid. In the case of a photographer, 80% of the tasks that make up the occupation are different from what they were in 2000. Across all occupations, half of all tasks are uniquely human, compared to just 30% of tasks in 2000. Projections of these trends suggest this number could rise to 80% in the next ten years.

Perhaps most encouraging, this research found technology is increasing the demand for people to perform human work. As technology replaces many basic tasks and tasks that can be automated, the human component of jobs becomes the key differentiator and—according to the data—the chief contributor to value. In human work, technology is a complement to what humans bring to the work, not a replacement.

But more worrying is that the emergence of human work as the main jobs driver has been accompanied by larger numbers of people dropping out of the labor market even as unemployment also declines. As human work becomes an increasingly important share of job tasks, too many people lack the necessary knowledge, skills, and abilities.

If a task is repetitive, it can be automated—this much has been clear since the first robot replaced an assembly line worker. The jobs most likely to be lost are those that consist of a single or well-defined set of repetitive tasks.

This already has happened at a large scale. When a Subaru plant opened in Lafayette, Indiana, in 1989, a human performed nearly every weld on each of the eighty-eight cars produced there daily. By 2016, robots were doing the welding and the plant produced 1,350 cars every day. AI is now being coupled with these robots to do inspections and identify defects for quality-assurance purposes—and a whole new category of workers may see their jobs disrupted.

Jobs consisting entirely—or almost entirely—of repetitive tasks *are*

at highest risk of elimination, but all jobs will be transformed as companies automate the repetitive tasks within them. At the same time, the bar for what constitutes a repetitive task is constantly shifting as artificial intelligence becomes more sophisticated.

The economist Richard Baldwin, former senior advisor to President George W. Bush and a leading expert on globalization, has described AI not as "artificial intelligence" but rather "almost intelligent."[21] We know from the field of psychology that intelligence requires reasoning, abstract thinking, and problem solving—all things that, today, are not possible with machines. Yet machines are capable of learning quickly and learning from experience. This is why tools such as Google Home and self-driving cars are advancing so rapidly.

This innovation suggests that, when it comes to work, not only manual tasks can be automated. A lot of work that relies on expertise and knowledge can be analyzed and reduced to algorithms that can be applied to specific problems through automation. We always thought the distinction between low-skilled versus high-skilled workers was all-important. But now we know it doesn't matter so much. If a task is repetitive, even if it requires a high level of skill, it potentially can be automated. If jobs mostly consist of these repetitive tasks, they are at risk.

Some jobs comprising repetitive tasks are low skilled, but not all. After all, the welders making Subaru cars and trucks were highly skilled, but that didn't mean the tasks they performed could not be automated. What AI does to jobs is extend the reach of automation beyond manual tasks. Even highly skilled professionals such as lawyers, accountants, and surgeons can see their jobs threatened if all they do is apply their knowledge and skills—no matter how sophisticated—to common or consistent tasks. On the other hand, some jobs we usually consider low skilled, such as food servers, will remain, even as others in the same industry, such as cashiers, will likely disappear.

This asymmetry within and across industry and job classification suggests being prepared for the work of the future involves applied skills. But this is clearly not the whole story. Not all tasks can be automated, and not all jobs can be replaced by smart machines. Simply

put, not all work is repetitive, although some days it feels this way for too many of us. This nonrepetitive work—the work machines cannot do—is what we need to focus on.

So much of how we think about work and jobs is wrong. We still argue about whether we place too much emphasis on white-collar jobs, and whether more people should be encouraged to enter blue-collar jobs. For most of the 20th century, even most of the postwar period, this two-track approach was workable, and even generally correct. Most Americans quite accurately saw themselves as destined for one of two career paths: pursue a college degree (typically a bachelor's) or learn a trade.

These days, though—as in just about everything, it seems—the norms no longer apply. The "either-or" approach to education and training is still clear and simple, of course—it's easily understood. But it's patently wrong. Not just morally wrong because of the inherently unjust sorting mechanism it creates, but factually wrong.

Careers simply don't work like this anymore. Few of today's workers hold jobs that resemble the blue-collar work their parents might have done. Technology is too pervasive, the need for higher-level skills such as communication, teamwork, and critical thinking too strong, for any job not to require some type of college-level learning. Career preparation no longer is adequately defined by the college-or-not choice.

Instead, what seems to be emerging is a vast gray area, a fluid, ever-expanding workspace that includes everyone from coders in Cupertino to health aides in Hattiesburg. A growing number of jobs in this huge in-between space—secure and satisfying jobs—can be had by those who earn a credential such as a certificate or industry-recognized certification.

In the future, it's likely there will be no such dichotomy as blue-collar and white-collar jobs. Practical skills matter in all jobs, and so do other human traits such as teamwork, communication, and abstract reasoning. What will matter more is how these abilities are acquired and developed, and how they're synthesized through work into something meaningful.

I don't believe we can or should be satisfied to say the work of the

future is what's left over after the machines have their say. There are still lots of jobs that machines could do but don't yet because employing people is less costly than capital investment or companies haven't gotten around to automating their jobs. But these jobs don't have much of a future. People who hold these jobs must always look over their shoulders wondering if theirs will be among the next jobs lost.

We instead should be thinking about the work that won't go away—the work only people can do. It's why I call this kind of work "human work." It is the work upon which our collective future will be based.

What, then, is a more operational definition of human work? For starters, it is work in which the people performing it are actively engaged and responding to their environments. Because the landscape for human work is dynamic, it isn't repetitive and it's much more difficult to automate—good news for us, but less so for the machines. AI gives machines the ability to learn through repetition, but the harder it is to discern patterns, the more likely it is humans will be needed to do it.

The most unpredictable environments are those created by other humans, which is why so much human work involves interacting with people. Human work also involves creativity, including imaginative approaches to solving problems. Another word for this kind of human work is innovation. The ability to come up with new approaches to addressing challenges—no matter how big or small—is of ever-increasing value in most work, if not all.

Ken Goldberg, a noted AI expert, roboticist, and all-around Renaissance guy, thinks a lot about these issues. He's a distinguished artist (with an Emmy nomination to back it up), an inventor (he holds several patents), and the William S. Floyd Jr. Distinguished Chair in Engineering at the University of California, Berkeley. Goldberg has been at the leading edge of the dialogue about what robots, AI, and other smart machines can and cannot do. He told me many commentators at home and abroad have it wrong when they try to understand the capabilities of advanced technologies.

"Humans deal with nuance and subtlety," Goldberg said. "There's no sign that AI is close to understanding these things." He said we

should focus instead on the notion of human/machine "complementarity"—the principle "that what humans are good at is complementary to what machines can do, and vice versa."

Goldberg offers what he calls a "radically hopeful" vision for AI and robots, in which society takes advantage of the capabilities of machines, understands their limitations, and refocuses on the human skills and knowledge that define emerging human work.

"We shouldn't be teaching coding to preschoolers," Goldberg observed, reflecting on the proliferation of products and educational strategies that app developers and publishers peddle to teachers. "They need to learn to communicate, collaborate, and build stronger connections to each other as learners." Goldberg said nurturing these foundational human capabilities is key to the lifelong development and continuous growth of human workers.

What all this means is people need to develop the knowledge, skills, and expertise human work requires. Human work is what people need and want, and, by definition, human work calls upon the unique and highly developed talent of individuals for the betterment of society.

The Human Effects of the Transformation of Work

Several years ago, I was talking to a friend about our respective work experiences. I told her how much satisfaction I get out of work, personally and professionally. I find meaning and value in work, I argued. I felt as if my efforts—I was employed as an education policy analyst at the time—were contributing in a small way to something bigger.

She had a different view, saying her job was just a means to an end. Much of her job in health services was repetitive, and she found little joy through work. "Your first clue is that they have to pay you to do it," she argued sarcastically.

This is the dilemma of work in the modern world. While some find meaning and purpose in their work, others see it as strictly transactional: I work, somebody pays. Interestingly, workers in the United States generally agree with my view that there's more to work than just making money. As a recent study from Gallup pointed out,

"Enjoying their day-to-day work, having stable and predictable pay, and having a sense of purpose each rate more highly than level of pay among U.S. workers' criteria for job quality—even among those in the bottom 20% of incomes."[22]

But no matter one's view of what work should be, what may be more important is that technology is now changing everything. More tasks that previously required human intervention will be completed through advances in artificial intelligence and automation. Certainly, some jobs may be lost to AI, and others gained. But trying to sort the winners and losers is a fool's errand. There are simply too many variables to know exactly which jobs will be eliminated, or for that matter, which might be created.

We know the expanding capabilities of AI and other digital technologies are leading to new employment structures: empowering workers in some cases and displacing them in others. A new world of human work is emerging, but this does not change the fact that the future of work will include ongoing disruptions of employment on a substantial scale. Yet as we consider these changes, it's easy to lose sight of the massive transformation of the global job market that already has taken place, with profound implications not just for the economy but for the lives of millions of people.

Malaika White is one of those hit hard by this transformation. A single mother of two, a few years ago she suddenly found herself out of work. She had worked fourteen years in a variety of roles for Bank of America before it became clear to her the lack of a college degree limited her opportunities at the bank. She then took a supervisor's job with the government of King County, Washington, but two days before her probation period was to end, the county laid her off. "It was the scariest time of my life," White recalled. "I'd never been out of a job before. It was a point when I was at rock bottom."[23]

That's when she decided she would try again—for the fourth time—to further her education. In the winter of 2015, while in her mid-30s, she enrolled at Seattle Central College. She graduated with an associate degree in the spring of 2018 and is pursuing a bachelor's degree in public affairs at Seattle University.

"I was kind of embarrassed to come back to school," she admitted.

"But I always felt I had the potential to do more." This promise went unrealized for decades, even though White had taken a few faltering steps into college before this attempt. Her first try also was at Seattle Central, where she enrolled at age 19. It was there she met the father of her two daughters, DaVonne and Nieela, now teenagers. White acknowledged that back then she "didn't have a clear educational focus." She ended up dropping out after she became pregnant.

During her time at Bank of America, she "always had the desire to get an associate degree." She started and stopped school two more times while she was working at the bank. Those two attempts—one at Seattle Central and the other at a for-profit school that's now out of business—didn't work out, in part, because she couldn't afford child care. This is a challenge many students face: how to live their lives and go to school. "It's often the life circumstances that get in the way of education," said Sheila Edwards Lange, president of Seattle Central. Yoshiko S. Harden, vice president of Seattle Central, said many of the community college's students have "a margin of error that is so narrow. You have your funding, your classes, your car, your apartment. One of those falls, and it's a house of cards."

White's school experience has been different this time because she's taken advantage of the counseling and mentoring Seattle Central has made available to her. Even while enrolled, she had a job in the college's administration office—first working at the front desk and then being promoted several times to more advanced assignments before working for the Seattle Central Foundation. Her fourth time around, everything is working out, she said. "First, there's maturity. I'm much more focused now," she said. "My kids are older. They can take care of themselves. And I'm fortunate to work here, too, and they make my schedule flexible. And my counselors help me every step of the way."

Millions of people have similar stories. While White had a good job in a large, established company, this didn't insulate her from the changes sweeping through her industry—banking—or the overall economy. Although she had been doing well, with a stable job and solid middle-class lifestyle, White found herself out of work and facing an uncertain future. It wasn't just a job and income that had gone

away—she had lost her place in the economy, work she was good at, and her ability to provide for her children.

Fortunately for White, and others like her, the story did not end there. As with so many others in today's economy, she found the route back involved investing in herself and developing her knowledge, skills, and abilities. She found her way to and through a community college. For others, the path can be through a bachelor's-granting institution, a competency-based online program, an apprenticeship, company-sponsored education and training, or myriad options for learning what individuals need to know to succeed in a changing world.

Looking back, it's clear the shift away from an industrial-age job market began decades ago as the demand for talent, particularly people with technical skills, increased.[24] As technological change swept through the economy, it affected all jobs in all sectors. Skill demands began increasing as industries and occupations were transformed. This steady progression meant those without more advanced skills were cut off from good jobs and opportunities for advancement. Because this transformation of jobs was not widely recognized or fully understood, employers, policymakers, and education systems were slow to respond.

In the United States, all of this came to a head in 2008. The Great Recession has been described by the U.S. labor economist Anthony Carnevale as "a smart bomb targeting low-skill jobs." It was worse for many workers. Entire industries that had employed large numbers of low-skilled workers were wiped out.

Jobs came back from the depth of the recession, but they were not the same jobs that were lost. From December 2007 to January 2010, the economy shed a net total of 7.4 million jobs, 5.6 million of them for people with a high school education or less. Through early 2020, the economy had added more than 8 million jobs, almost all for people with some college experience or a college degree. Of the 5.6 million jobs lost for people with a high school education or less, only 80,000 ever came back.[25] From the pandemic job loss data, it's clear this cycle from the 2008 recession is beginning to repeat itself.

This same pattern of low-skilled jobs being replaced by ones requiring higher-level skills and credentials beyond a high school diploma is happening throughout the world. OECD's 2018 report on

employment used similar language to describe the trends in their more than thirty member countries: "The jobs destroyed during the crisis are not the same as those created in the recovery. Leading firms are in great demand of highly qualified personnel, with high-level cognitive skills—such as complex problem-solving, critical thinking, and creativity—and social intelligence—social perceptiveness needed when persuading, negotiating, and caring for others. These skills are in short supply in many countries and people who possess them have been the main beneficiaries of wage growth."[26]

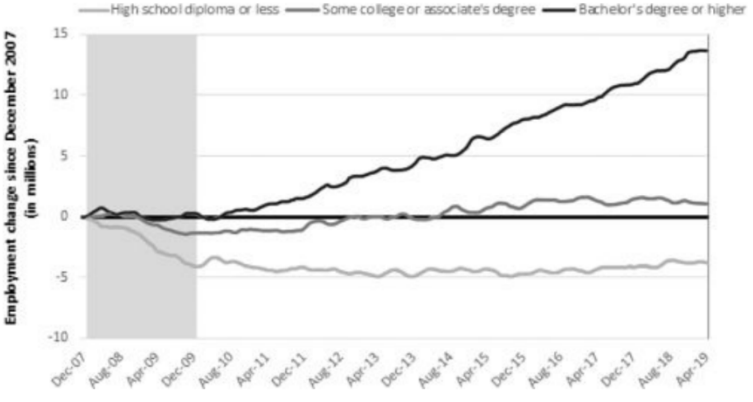

Figure 1. Since the end of the Great Recession, almost all job growth has been in jobs that require advanced learning.
Source: Georgetown University Center on Education and the Workforce, 2019.

However, many workers are not well equipped to meet the rapidly emerging labor-market demand for these higher-level skills. According to OECD's Survey of Adult Skills, almost half of adults in OECD countries have at best only a basic ability to solve problems using technology. This means they have no familiarity with computers at all or only can solve problems "that involve few steps and explicit criteria, such as sorting emails into pre-existing folders."[27]

Drilling down into the data on jobs is even more revealing about how talent has become the arbiter of opportunity. In the United States, the preponderance of good jobs—defined as those that pay at least

$35,000 a year and have benefits such as health care and retirement—available to Americans with just a high school diploma has fallen from a third of all jobs in 1991 to just 20% today. Meanwhile, the number of good jobs *is* growing, but they're nearly all going to people with credentials, including degrees, certificates, professional or industry-recognized certifications, or other earned qualifications.

So why are credentials awarded after high school so valuable that Malaika White and people like her want them badly enough to overcome barriers to earn them? It's an important question, and one some people find easy to trivialize. In their view, students are like proverbial sheep, pursuing formal learning in outdated structures and earning degrees they don't need and can't use simply for their prestige value. In sum, these critics say employers' preference for people with credentials beyond a high school diploma is mere "signaling" or a form of "credential creep."[28]

These arguments are, at best, wishful thinking and, at worst, an attempt to hang on to the privilege naysayers who make these arguments believe college degrees often signify. The truth is the demand for these credentials by both students and employers is a response to a real shift that has taken place in the knowledge economy—the shift to a talent-based job market.

As dramatic as the effects of technology and automation have been on jobs and workers, we face a future in which these shifts accelerate. Most observers believe the coming transformation of work caused by rapid advances in artificial intelligence will be even more disruptive, with erratic, sudden, and severe effects on particular occupations and populations.

Anxiety about the effects of AI on jobs is not limited to pundits and futurists—it is widespread and global. According to a poll on people's attitudes toward AI conducted by Northeastern University and Gallup, most people in the United States, Canada, and the United Kingdom, which includes England, Scotland, Wales, and Northern Ireland, claim they have solid understandings of AI. Fifty-five percent in the United States, 54% in Canada, and 52% in the United Kingdom say so, with younger people, not surprisingly, being more likely to say they understand it. But this supposed understanding does not foster

confidence. Most people in all three countries believe AI's effects will be negative. More than 60% of adults in Canada and the United Kingdom believe AI will eliminate more jobs than it creates, and more than 70% of Americans agree.[29]

The source of the widespread belief that AI will have adverse effects is obvious. After all, over the course of decades, technology has altered many if not most jobs. But until now, job loss because of technology, while significant, mostly has been limited to jobs based on repetitive or highly specific tasks, whether in lower-wage fields such as construction and manufacturing, or in higher-wage fields such as accounting and law.

The remaining jobs in high-wage occupations in which repetitive tasks are important could be hit hard by the spread of AI. Accounting giant Deloitte reported almost 40% of jobs in the legal sector could be automated within the next two decades.[30] And research based on data from Oxford University in 2016 predicted up to 95% of jobs in the accounting sector could be eliminated over time.[31]

This asymmetry in job losses will continue to evolve and change over time. But it likely will be concentrated in specific occupations and industries and will hit regions where these occupations and industries predominate. And make no mistake—coming advances in technology and artificial intelligence will lead to the elimination of more jobs. An oft-cited analysis by McKinsey lays out the sobering statistics.[32] By 2030, 375 million people worldwide are likely to need to change occupations. On a percentage basis, the effects are greatest in the most advanced economies—a third of workers in the United States and Germany, and half of workers in Japan, could be displaced.

Again, whether the job losses caused by AI are widespread or are more focused isn't the headline. More important is that available data suggest people are not ready for changes in work on the horizon. While large majorities believe AI will eliminate jobs in the future, only 37% of workers in Canada and 34% in the United Kingdom worry their own jobs are threatened by technology or artificial intelligence. And, get this—only 17% of workers in the United States are fearful about their jobs on this front.[33] People shouldn't panic, but frankly,

this looks like complacency.

The Structure of Work Is Changing, Too

Work is being transformed by more than the evolution of jobs as AI takes over the more repetitive tasks people used to do. We are also seeing a strong shift away from long-term employment to shorter-term work. A big part of this is explained by the emergence of new, short-term employment structures—the so-called "gig economy." The rise of companies such as Uber, TaskRabbit, and Airbnb has been well documented. But this emergence of on-demand solutions to help make people's lives easier is just the beginning.

More broadly, we are seeing a large increase in the proportion of workers for whom contract work, digital marketplaces, and other short-term, contingent arrangements are replacing full-time employment and careers. According to McKinsey, about a quarter of people working in the United States and Europe are classified as "independent workers."[34] The OECD reported in 2019 that one of every nine workers in the world's most advanced nations is working on a temporary contract—in effect, short-term "jobs" without long-term prospects.[35] Both sources note the number of these workers is expected to grow as digital marketplaces become more widespread and displaced workers use independent contractor or temporary work to re-enter the workforce.

Attitudes toward changes in careers and work were probed by the Pearson Global Learner Survey, conducted by the Harris Poll. As the name implies, the survey draws on data from nineteen countries to provide a unique global perspective on how changes in work and careers are being experienced. The authors describe the shifts in attitudes as the emergence of a "reinvention mindset among workers. Globally, 70% of people agree working for a single employer for their entire career is "old-fashioned," and 84% agree with the statement "my career path will be significantly different from my parents' or grandparents'."[36]

In one sense, concerns about these shifts in the workforce are

nothing new. In the late 1980s in the United States, under President Ronald Reagan, a massive effort was undertaken to study issues of workforce quality and labor market efficiency. A blue-ribbon commission, led by prominent voices from the business, labor, and education fields, was formed to look at the long-term issues of work and workers in an increasingly technology-driven labor market. The commission contracted with dozens of analysts and researchers—me included—to explore "increasing the excellence of the American workforce." Several papers took direct aim at the issue of independent workers and temporary employment. Rebecca Blank, for example, the former Princeton University economist and current University of Wisconsin-Madison chancellor, observed this phenomenon "is a significant aspect of the U.S. labor market, and has been increasing in importance over the past decades."[37]

While it is certainly not new, the label we overuse to describe this trend—"gig economy"—is an international phenomenon. The platforms that support such work are, by their nature, scalable across political boundaries. Even as we have grown somewhat accustomed to the pace of change in today's economy, it is remarkable to realize Uber launched its ride-sharing service in April 2012 and now operates in at least sixty-five countries.

It's not at all clear governments can do much to change the trajectory of these contingent work platforms, even if they wanted to. After a recent trip to Costa Rica, a friend reported he was happy to see the Uber app on his phone working fine, with many cars available. But he was amused when the drivers asked him to sit up front—leaving his wife in the back—to make it less likely they'd be stopped by police. If they were stopped, they were asked to say the driver was an old friend who had stopped by to give them a lift. It turns out that despite the fully functioning app, ready supply of cars, and enthusiastic drivers, Uber was not legal in Costa Rica at that time.

While making deliveries and driving for Uber may not be a high-skill occupation, the "uberization" of work is spreading to occupations in which people's skills are the decisive factor. In fact, leading thinkers such as Roger Martin, a management expert and former business school dean at the University of Toronto, are referring to the

emergence of a "talent economy."[38] In the talent economy, highly skilled workers operate as independent contractors in order to maximize their opportunities and incomes.[39] Unlike the "Uber economy"—providing ready access to undifferentiated workers and services at low cost—the major driver of the talent economy is quality, not cost. People with knowledge and skills in demand are finding these shifts an attractive alternative to customary employment practices. While they only make up 20% of the contingent workforce, people making more than $100,000 per year are its fastest-growing segment.[40]

But whether working as a part-time Uber driver or an in-demand IT professional, people in contingent work arrangements face a new set of problems, from access to health care and retirement to assuring long-term security and social relationships. Today, it seems impossible to overstate the effects this transformation of the job market has had on people worldwide. For some—those with the requisite knowledge, skills, and abilities—the talent economy is increasing opportunity, allowing better life-work balance, and creating a greater sense of well-being. For others, the uncertainty around work is a growing problem with potentially devastating effects for individuals and society.

Good Jobs, Human Work, and the Quality of Life

Holding a good job, or at least being able to find good work, has become inextricably linked to well-being and the quality of life. The talent economy creates many opportunities for those with the necessary knowledge, skills, and abilities. For those without in-demand talent, it is ruthless. The consequences of being left out of the economy are no longer abstract—they are directly measured in life expectancy and other social indicators. The United States is now going backward on many of these indicators, and the failure to nurture and develop talent appears to be the culprit.

A groundbreaking 2015 research paper[41] by Anne Case and Angus Deaton and their 2017 follow-up[42] revealed exactly what is at stake in the growing relationship between talent and quality of life. Their

analysis of mortality data, broken down by race and level of education, shows a truly disturbing rise in "deaths of despair" among white working-class people, especially those who are high school dropouts or have never obtained recognized learning after high school. What seems to be happening is these millions of Americans are losing faith in the possibility of economic opportunity and social mobility—that is, the foundation of the American Dream. These trends will only get worse unless we can nurture and develop the talent of all people.

Since Case and Deaton first raised the specter that rising mortality rates among middle-aged, working-class whites represent deaths of despair, other researchers have looked into the data to better understand the rising inequity and unfairness of increased mortality—the fact that Americans die at significantly different rates based on economic status, education levels, and other factors.

While Case and Deaton focused on working-class whites, it has long been known mortality rates for African Americans are significantly higher across the board than those for whites. Researchers have found that among African American and older whites not included in the Case and Deaton analysis, premature deaths caused by cardiovascular disease and cancers explain most of the difference rather than the three causes labeled deaths of despair—suicide, alcoholic liver disease, and drug overdose. This is hardly comforting, however. According to the researchers, the data show the long-term psychological and physiological effects of coping with stress resulting from their precarious and worsening economic and social situations is a major factor in the higher mortality rates among these Americans.[43]

Much evidence supports the idea that fears of a decline in economic opportunity are well grounded. A study released in 2019 reveals the shocking extent of accelerating wealth inequality in America.[44] Out of the total assets of $114 trillion owned by Americans in 2018, the wealthiest 10% owned 70% of the total, up from 61% in 1989. Meanwhile, the bottom 50% of American households had virtually no net worth at all—down from 4% of the total in 1989 to 1% in 2018.

Sadly, this has long been the reality for millions of nonwhite Americans. In 1989, median white household wealth totaled $424,000, compared with just $78,000 for African American families and

$84,000 for Latino households. By 2016, white wealth had grown to an average of $919,000, compared with $139,000 for African American families and $172,000 for Latino families. While income inequality has received heightened attention in recent years—and deservedly so—it's clear wealth inequality is an even greater problem.

Of course, both disparities reflect a third problem, which is the stark divide across racial and ethnic groups in educational outcomes after high school and the earning opportunities that provides. In 2018, 48% of whites had completed associate or bachelor's degrees, compared with just 32% of African Americans and 25% of Latinos.

Also, geography is an underreported factor that compounds the steep challenges facing the United States's poor households and people of color. Residents living along the southern border with Mexico, for example, many of whom are Latino immigrants, face an array of discriminatory education and workforce training practices.

While portraits of displaced manufacturing workers in Rust Belt states or coal miners in the Appalachian region—many of them white—were common after the 2008 recession began, less prominent were the stories of those for whom persistent discrimination stretches back generations. In the Black Rural South, an area comprising 157 counties where African Americans are more than 35% of the population, significant injustice exists. More than 60% of African Americans in the rural South have a high school diploma or less, while only 10% of African Americans in the region have a bachelor's degree. African Americans are overrepresented among those with low educational attainment compared to all other racial and ethnic groups.

The exclusion of these communities from the dialogue about preparing and deploying future workers is not only unjust, it is also unwise. As a report from the Joint Center for Political and Economic Studies notes:

> Any future of work discussion that excludes the Black Rural South is incomplete. We cannot build a modern system that fully transitions American workers to a new economy without consciously addressing the past, present, and future of the Black Rural South. Continued neglect of the residents of the Black Rural South sets the stage to neglect the residents of other regions with industries of declining significance—such

as the Industrial Midwest, Appalachia, and eventually Silicon Valley.[45]

All this shows how work is central to our lives and the health of communities and nations. For many, work is still just a job, but even so, not all jobs are created equal. The divide between good jobs and not-so-good jobs is increasingly stark and important to the overall quality of life of people and communities. But what is a good job? Economists have come up with different criteria, but most include pay above poverty level and access to health care and retirement as decisive factors.[46]

Perhaps we can learn more about what makes a job good by asking workers themselves. Gallup's Great Jobs Survey does that, and it found workers consider factors beyond pay and benefits as necessary for jobs to be considered good. Workers value job security and predictability along with higher wages, and they also consider factors such as career advancement opportunities and having a sense of purpose and dignity important as well.[47] About 40% of Americans consider their jobs to be good based on criteria important to them, while 16% say they are in bad jobs. A plurality of Americans (44%) consider their jobs to be mediocre because they lack some characteristics these workers consider important. This might not matter so much were there not ample evidence job satisfaction has a direct bearing on many measures of quality of life.

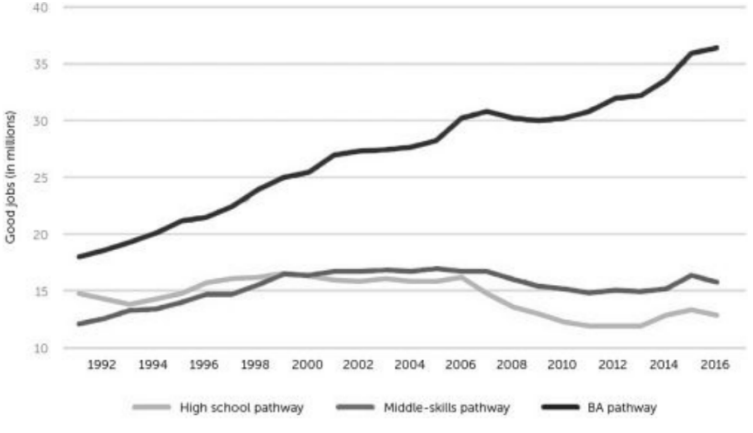

Figure 2. Good jobs (those that pay at least $35,000 for workers

25–44 and at least $45,000 for workers 45–64) are going to people with more advanced learning.
Source: Georgetown University Center on Education and the Workforce analysis of data from the U.S. Census Bureau and Bureau of Labor Statistics, *Current Population Survey*, 1992–2017.

The likelihood people hold good jobs rather than mediocre or bad ones goes up dramatically with higher levels of education, just as income is higher in jobs that require college-level skills. There is, however, an intriguing exception to this rule. Workers with high school education and professional certifications but no education beyond this are among the most likely to say they are in good jobs: 49% of workers fitting this description have good jobs, compared to 40% of high school graduates without certifications. They even do better on this measure than workers with master's degrees or higher: 47% of them consider their jobs good. This surprising finding reveals something about the importance of documented skills, not just for earnings but also for people's sense of the value and the significance they attach to their work. I'll come back to the implications of this reality later.

While the talent economy presents many challenges to workers, we shouldn't lose sight of the simple fact that having the opportunity for a good job now requires learning and a credential beyond high school. This is true for everyone. Real opportunity must exist for all, so in a talent economy we must seek to understand and eliminate racial disparities in educational outcomes after high school wherever we find them. Disparities in educational attainment based on income, geography, age, and especially race aren't acceptable because the consequences of failing to find success in our education system are so severe. As important as it is to increase the proportion of adults with education or training after high school, we should never forget it is a means to an end, and this end is greater economic opportunity and social mobility for all.

The transformation of work is about much more than the economy. It is fundamentally an issue about human flourishing—of prosperity in an era when such success seems increasingly elusive to those without the requisite knowledge, skills, and abilities and the credentials that

signify their achievements. Those without quality post–high school credentials are increasingly relegated to dead-end jobs or no jobs at all.

Of course, the knowledge there are large numbers of people without the skills necessary to thrive in this new economy is not new. But many more people are at high risk of joining them through no fault of their own as their jobs are transformed or disappear in unpredictable ways. For many, a world without opportunities for meaningful work is a world of despair.

When it comes to adapting to the transformation of work caused by AI, the data don't paint a rosy picture. Fewer than half of workers say they know what skills will be needed in the future to adapt to the spread of AI (45% in the United States and Canada; 41% in the United Kingdom), and a slightly smaller percentage say they know where they can get the education and training they will need. However, too few people understand the urgency. While almost all workers see value in learning throughout their careers—95% in the United States, 94% in Canada, and 92% in the United Kingdom—few seem to see it as an absolute necessity. Thirty percent of workers in Canada and the United Kingdom believe their skills will never become obsolete or dated, while 42% of workers in the United States believe this, and an additional 22% say it will be ten years or more before their skills lose relevance. (I'm assuming a lot of these people say they'll be comfortably retired by then).[48]

This is frankly a ticking time bomb—both for them and for the economy. The scale of the shifts affecting work is at least of the same magnitude as the Industrial Revolution.[49] That's a dangerous reality. While social and economic support structures eventually were transformed worldwide by the Industrial Revolution, we should pause to consider the resulting disruptions and how long it took to overcome them. Chief among them was the need to dramatically increase education levels across the entire population as vast numbers of people abandoned rural areas for jobs in factories and new lives in cities. Eventually, the Industrial Revolution prompted the introduction of universal primary and secondary education throughout the world—a massive accomplishment for the common good.

The technological revolution requires a response at a similar scale,

including a similarly dramatic increase in education levels across the board. Indeed, the time has come to commit to universal learning beyond high school—assuring everyone can gain the knowledge, skills, and abilities needed to thrive in a changing economy and world throughout life.

Human Work, Fairness, and Opportunity

The new knowledge economy creates many opportunities for those with talent, but for those with talent deficits, it is ruthless and unfair. Those who have not developed their knowledge and skills, as represented by a college degree or other credential after high school, are increasingly relegated to lives of hardship and struggle. In this labor market, economic opportunity and social mobility require effective learning throughout life. As mentioned earlier, the consequences of not getting this learning already are devastating for individuals and families and are no longer abstract. They can be directly measured in life expectancy and other key social indicators. In the future, the effects will only increase.

More people are falling below the threshold at which economic opportunity and social mobility are possible, and as more drop off, social stresses can lead to seismic fissures in democratic nations. In the United States, people are segregated not only by race, geography, and income but also by education levels. The rising tide of human learning needs will submerge more and more people if our education systems and the labor market do not adapt soon to these demands—and with devastating societal consequences. People need to reskill and up-skill more frequently in today's economy. And expanding opportunity for learning after high school is an essential response to the challenges arising from the shifting nature of work.

In education, there has been a decades-old debate about the quality of the learning experience compared with the opportunity it creates by race, income, and other factors. Yet we now know this is really a false dichotomy. Quality learning without equitable outcomes—in other words, fairness—is merely the reproduction of privilege. More people of color with credentials of low quality is a broken promise, a systemic

failure that exacerbates the unfairness they and others face.[50]

The implications of this shift in the learning enterprise—whether formal learning in colleges and universities, workforce training programs, or the acquisition of knowledge and skills in less formal contexts—are profound. This shift is also affecting job markets and the way work is organized and structured. We must recognize that talent already has emerged as the primary arbiter of employment. This demand in the job market for talent puts *people*—diverse groups of learners and workers—at the center of the new human work ecosystem.

But the dominant narrative about the effects of technology on jobs hasn't been about talent—it's been about winners and losers. We talk about how some people, especially those with technical skills, are thriving while others are left behind with declining standards of living. Mass media tends to accentuate this winners-vs.-losers storyline. Numerous stories have focused on how some technology companies such as Apple, Facebook, and Twitter have become fabulously profitable while some of the oldest and most established brands, including Sears and Kodak, have become irrelevant or disappeared entirely. Meanwhile, we read that the regions where tech companies are located are dynamic and growing while other, less fortunate areas are mired in downward spirals of decay and depression. The bottom line of this winners-and-losers narrative is some people will move ahead to bright futures while others will be doomed.

Given the prevalence of this narrative, it is not surprising some people see themselves as victims of an unfair system and uncaring "elites," while others unfairly see their good fortune as evidence of better personal decisions or even innate superiority. As the effects of AI move through the economy and affect all sectors and occupations, we can only hope this narrative of winners and losers will die out.

Yet we don't know what kind of narrative will replace it. It could be an even more defeatist one of "there are not enough jobs so we might as well pay people not to work." Or it could be a dystopian storyline about how technology is our true enemy and a threat to life itself. But I shudder to consider the consequences of framing our social and economic debates in these terms. If we take the right steps, a more

hopeful narrative can emerge—one based on the idea that technology allows us to focus on what it means to be human and to do human work.

To construct this narrative, though, we need to understand more about what human work is and how it will affect the economy and society. Seeing human work through the eyes of the workers themselves is one way to begin.

2

The Work Only Humans Can Do

I work all day at the factory,
I'm building a machine that's not for me,
There must be a reason that I can't see,
You've got to humanize yourself.
—The Police, "Rehumanize Yourself," 1981

Human work is on full display at a San Francisco–based organization called Safe & Sound, which works "to prevent child abuse and reduce its devastating impact." CEO Katie Albright, a former deputy city attorney and leading child advocate and education expert, personally exemplifies many of the qualities that define the human worker model.

Talking with her in 2019 at the organization's headquarters in an old Victorian fire station, I was struck by how her language about the people served by Safe & Sound, and the staff members who work with those clients, represents the vanguard of this human work paradigm. Albright is deeply compassionate toward the people she works with. She is rooted in the idea that critically judging and evaluating what works and what doesn't is key to the organization's success. She has a

strong ethical focus that drives her work. And she uses her powerful communication skills, which often involve "actively listening," to constantly adapt the techniques used to address the root causes of child abuse.

"So much of what we do centers on establishing or rebuilding trust," Albright said as we toured the facility. "Our task is to empower people to understand and address their own trauma, keep children safe, and help build stronger community." By community, Albright means both literally in the city and region, but also among the individuals participating in the organization's services. Safe & Sound's team of sixty employees and about one hundred volunteers serves an active family cohort of 1,200 at any given time, and works with more than 12,000 people annually through a wide array of services including counseling, trust-building exercises, and basic needs provision (such as meals) both in person and by telephone.

Albright said the task of preparing herself and the team for the work of addressing family needs to prevent child abuse never ends. Staff members are constantly being trained, supported, and reskilled to keep up with the latest research, field-based knowledge, and counseling techniques. "They are doing human work, and that means they can never stop learning," she said. "And so are the parents we serve. Teaching them how to be better parents has a real impact on the safety and happiness of their families."

Albright shared a manual used to train staff and volunteers who work on their twenty-four-hour parental stress phone support line. The manual, more than sixty pages long, is replete with illustrations and examples of how team members need to develop and hone their active listening techniques, mindfulness, and other key traits. It's a constantly evolving process of development and training, according to Albright, as research and experience continue to guide the important, lifesaving work Safe & Sound does.

So, let's return to the question. What *is* human work? Katie Albright and her colleagues at Safe & Sound point in the direction of an answer: human work is the work only humans can do. It blends our human traits, such as compassion, empathy, ethics, and personal communication, with our developed human capabilities, such as

critical analysis, judgment of quality, and anticipation of what others might do. It requires knowledge and skill. And human work brings together the things that give us meaning and allow us to continue to flourish over time, including learning, earning money, and serving others.

Make no mistake, being paid for work—having a job, making a living—matters. Everyone needs an income to survive, but for most people, paid work represents something more. It's an expression of position in the world, identity, and sense of self-worth. And paid work and the jobs people hold are changing dramatically, even if they aren't going away. But human work is not merely about a job. It is about meaning and opportunity; it is what we *do* as humans. It is core to our existence. Work is aspirational. The phrase "my work is never done" is, in reality, a good thing. A job is a component of human work, but the two are not synonymous.

This is a case where a learning task most of us acquired early in life —consulting a dictionary—can help. According to the *Oxford English Dictionary*, work is an "activity involving mental or physical effort done in order to achieve a purpose or result," while a job is simply "a paid position of regular employment." Certainly, people work while on the job, at least some of the time, but not all work is a job. I find it interesting effort alone is not enough to qualify an activity as work. The essential quality of human work is it serves a purpose or leads to a result.

Of course, some work is paid when the purpose or result is of financial value to someone else. But even then, work has meaning to the person who performs it. This meaning may come from the satisfaction of having and applying expertise. It can come from a sense of doing something of use to the greater society, or the pride of providing for people important to us. But whatever the purpose, work has meaning whether it is a paid job or not. Work is core to our existence, and when the ability to perform meaningful work is taken away, it is devastating to people and societies.

Service to others is another kind of work that brings meaning to our lives. No matter how large or small the effort, to serve others is a key to a satisfying and rewarding life. Service is also essential to building

healthy communities and a stronger society. Like all work, service requires effort toward some purpose, and it also draws on people's knowledge and skills in the way jobs do. Of course, many use money gained through work to be of service to others, as well as support themselves.

Work is no longer just about jobs—if it ever was. Earning, learning, and serving is the new paradigm. Developing one's abilities throughout life and applying them to make a living and improve the lives of others are the three core activities everyone must have the opportunity to do. Without all three, the quality of our lives suffers. Just as at Safe & Sound, human work blends learning, earning, and serving, because together these things articulate our shared or collective obligations both to one another and ourselves.

The New Occupations of Human Work

How many times do people ask, "What do you do for a living?" Whether it's an innocuous conversation starter or the first question border control agents ask of people who arrive on international flights, the question has always caught me by surprise. We're accustomed to answering the question with a simple, one-word answer: attorney, accountant, machinist, farmer, teacher, or any of many other possibilities. In fact, the U.S. Bureau of Labor Statistics classifies every worker in America as belonging to one of 867 distinct occupations. If, like me, you've never had an occupation that fits neatly into one of those categories, you may have an inkling of what the future holds for millions of workers.

Human work doesn't fit into the neat categories of the industrial age. Rather than mastering a single body of knowledge or set of technical skills, to do human work, people must develop a wide range of abilities and apply them to solving complex problems in dynamic settings. As we saw from examining the effects of technology on jobs, if a job can be defined by a single body of knowledge, no matter how arcane, or a single set of skills, no matter how specialized, there is a high likelihood artificial intelligence can do it.

What data and research are pointing toward is the emergence of new