

# HARNESSING REVOLUTION

**Creating the future workforce**

Ellyn Shook and Mark Knickrehm

# HARNESSING REVOLUTION

## CREATING THE FUTURE WORKFORCE—TODAY

**Digital has already delivered a major blow to businesses slow to respond. There's more to come. The very concept of work is being redefined as different generations enter and exit the workforce amidst a rapidly changing technological landscape. Responsive and responsible leaders must act to harness the power of the Fourth Industrial Revolution for long-term advantage and shareholder value. Mindful to put their people first, at the center of change. The new leadership imperative is clear: Create the future workforce. Now.**

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The Fourth Industrial Revolution will create winners and losers. Both organizations and individuals. Seismic shifts will wreak havoc in some local and national economies and may even contribute to social unrest. Tackling myriad issues involved in organizations won't be easy. And the global economic context isn't helping.

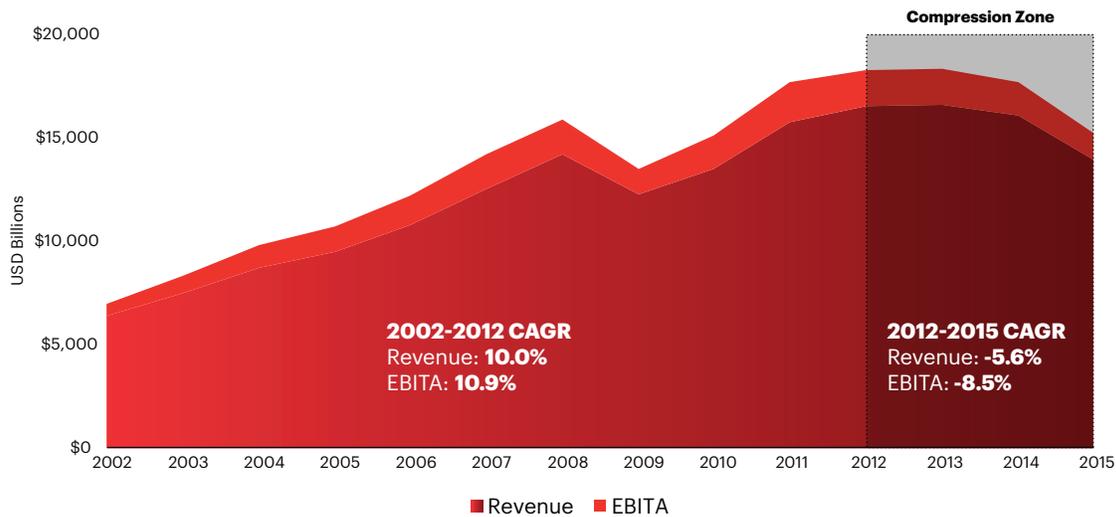
At the very moment the global economy should have achieved a boost thanks to digital—from 2004 to 2014—labor productivity growth slowed significantly. In 30 of the 31 advanced economies it declined from a 2 percent average annual growth rate from 1994 to 2004 to a 1 percent average.<sup>1</sup> The immediacy of today’s workforce challenge is compounded by recent macroeconomic trends that show overall sluggishness: The revenues and profits for a sample of the largest 1,219 companies across nine industries show a clear decline (see Figure 1).

**Figure 1**

Overall economic sluggishness

**EBITA and Revenue**

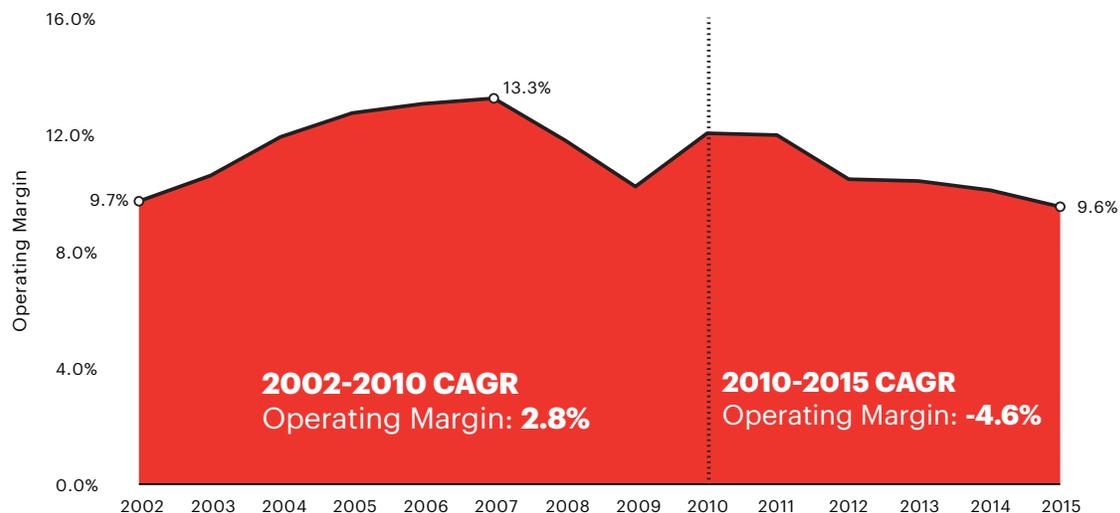
Stacked area chart, 9 industries, 2002-15, US\$ billions



**Operating Margins**

EBITA/Revenue (%), 9 industries, 2002-15

**KEY:** — Operating Margin (EBITA/Revenue)



Notes: Accenture Research analysis. Sample comprises 1219 companies from 9 industries. Communications, Air/Freight/Logistics, Auto (Automobile Manufacturers), Industrial Equipment, Infrastructure, Chemicals, Energy, Natural Resources, Utilities. Data is sourced from Capital IQ.

Leaders need to leverage every advantage at their disposal—including one which risks being overlooked as companies focus on technology investment: ensuring people are relevant and adaptable to rise to the challenge of this new revolution.

If this sounds like an HR issue—don't be fooled. Creating the future workforce—now—is the responsibility of the very highest levels of an organization because of the complexity and the urgency of the challenge and opportunity. Navigating the path towards the workforce of the future will require leaders to ask tough questions. How do we: Attract and develop the new talent we need? Scale and accelerate the pace of change? Make sure the people with us now don't get left behind? Secure the right amount and type of investment in our people to prepare them?

**“A human in the middle of the digital environment is still using age-old technologies like walkie-talkies. We need to digitize the human. Digitalization is not about removing people but about making operations safer and efficient. It will create new jobs but will change the type of jobs.”**

Michael Lefenfeld

PRESIDENT AND CHIEF EXECUTIVE OFFICER, SiGNa CHEMISTRY

Luckily, at the dawn of the Fourth Industrial Revolution, leaders have an advantage. Thanks to the learnings of the last—online—revolution, they're acutely aware of the disruptive nature of technology. And are experiencing the unprecedented scale and velocity of transformation in real time.

Because of this consciousness, and the increase in knowledge and information available to them, leaders can work proactively to address the complex equation they're facing. There may never have been a better opportunity to get ahead of this issue. And never a greater risk of inaction.

Accenture launched original research in three parts to help leaders understand the situation and their options to act: The Worker Values Index created in partnership with Gallup. Econometric modeling to codify the impact of automation on labor productivity.<sup>2</sup> And finally, a survey of more than 10,000 workers in ten countries exploring the impact of technological advances on work today and in the future.

Through the research, a picture emerged of the actions needed by leaders to shape and prepare the workforce along the entire talent supply chain. Chief among them:

# 1 **ACCELERATE RESKILLING PEOPLE**

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# 2 **REDESIGN WORK TO UNLOCK HUMAN POTENTIAL**

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# 3 **STRENGTHEN THE TALENT PIPELINE FROM ITS SOURCE**

The good news: These actions will enable leaders to build on a workforce that's already highly engaged with digital. And reshape their organizations to allow workers to flourish in a future augmented by new technologies in a way that drives real business value—labor productivity, talent acquisition and retention, as well as innovation and creativity.

The bad news: The clock is ticking. CEOs need to put people as the priority or risk leaving scores of workers—and their company's competitive strength—behind.

# ACCELERATE RESKILLING PEOPLE

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Although CEOs rank workforce high on their list of priorities, they're not translating concern into action. In the meantime, the skills gap is becoming an ever-widening chasm. Already today, 40 percent of employers report talent shortages.<sup>3</sup> With dramatic shifts in expected skills requirements, the gap is likely to increase. Dramatically. In fact, by 2020, more than one-third of the desired skill sets of most jobs will be comprised of skills not yet considered crucial today.<sup>4</sup> Business leaders need to take action when it comes to reskilling the workforce. And contrary to grim narratives in everything from "Terminator," to "2001: A Space Odyssey" and "Westworld," the digital future of work is anything but dystopian. If we as leaders take control of shaping the future.

There will be disruption. This needs to be managed carefully and transparently by business, government and stakeholders in collaboration. But consider this: Machine augmentation can, in fact, liberate human potential. Accenture and the World Economic Forum's (WEF) analysis of the future of work use cases across 12 industries reveals that two-thirds will augment the worker or create new roles.<sup>5</sup> In this era of rapid and widespread technological change, being human is more valuable than ever.

**"I really believe the CEO needs to become the Chief Learning Officer of their company. And I don't think CEOs spend enough time thinking about learning in their organizations."**

Mara Swan

EXECUTIVE VICE PRESIDENT, GLOBAL STRATEGY AND TALENT, MANPOWERGROUP

Counter to the negative spin in the zeitgeist, workers of all generations and skill levels appear ready to embrace the new reality of digital in the workforce. In fact, 64 percent recognize that the pace of change is accelerating thanks to technological advances.<sup>6</sup> Nearly all, (92 percent) expect the next generation will work very differently because of these changes.<sup>7</sup> And instead of resenting technology, 84 percent report being excited about the changes it will bring.<sup>8</sup> A full 87 percent are downright optimistic, projecting that it will actually improve their work experience in the next five years.<sup>9</sup>

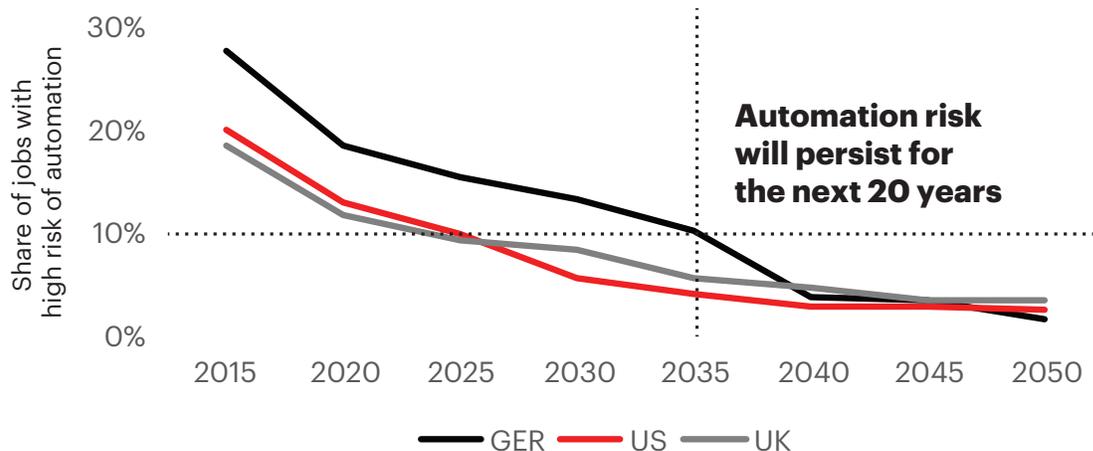
This sunny outlook has been overlooked by many leaders (and media outlets.) But serves as an opportunity for CEOs to create a vision of the future that's good for business and good for people.

Many of these same workers (58 percent) are also aware of the skills they need to develop in order to remain relevant.<sup>10</sup> Eighty-five percent said they would invest their free time in the near future to learn new skills.<sup>11</sup> Sixty-nine percent cited “on-the-job-training” as the best way to learn.<sup>12</sup> Leaders should take note of these findings. Why? Because countless change management journeys have shown that receptivity and alignment of outcomes is more than half the battle when it comes to changing behavior.

Our model shows fewer jobs will be lost to automation if people are able to reallocate their skills to tasks that require more “human skills” such as complex analysis and social/emotional intelligence. The UK would be able to reduce the share of jobs at risk of being fully automated to less than six percent by the year 2035 if skills are reallocated. Germany to 10 percent and the United States to just four percent (see Figure 2).

**Figure 2**  
Impact of Automation

The risk of automation of the workforce will be a challenge in the coming years. However, a study covering Germany, the U.S. and the U.K. shows that the risk of jobs lost to automation will dramatically diminish by 2035.



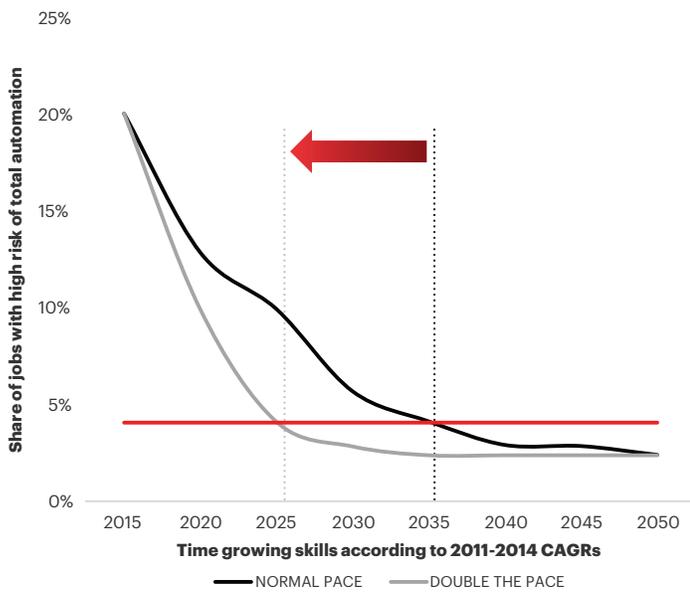
Source: Accenture Research, OECD, Osborne & Frey (2013)

By doubling the pace at which workers build relevant skills, the risk of job losses can be diminished dramatically (see Figure 3). In addition, Accenture research shows that artificial intelligence alone has the potential to double the annual economic growth rates and boost labor productivity by up to 40 percent by 2035 in the 12 developed countries examined.<sup>13</sup> Estimates for Europe show that a one percent increase in training days leads to a three percent increase in productivity, and that overall productivity growth attributable to training is around 16 percent.<sup>14</sup>

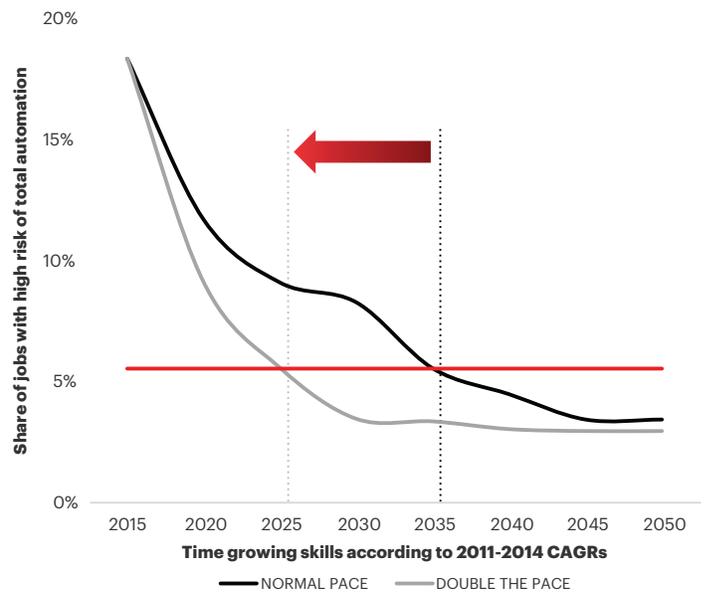
**Figure 3**

Doubling the pace of learning reduces the number of jobs at risk of automation.

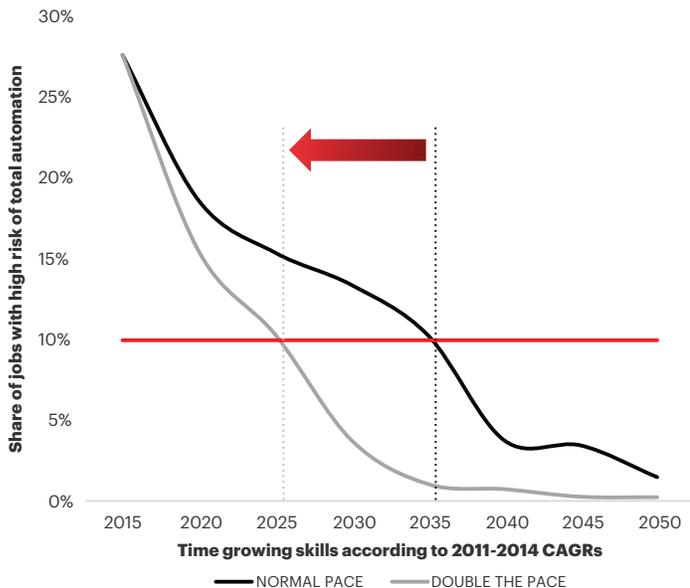
**Impact on the U.S.:**



**Impact on the U.K.:**



**Impact on Germany:**



**“Education can really help to alleviate the challenge of job losses; both in terms of up-skilling those at risk of automation and providing meaningful occupation for people in the future.”**

Andrew Moore  
DEAN OF THE SCHOOL OF COMPUTER SCIENCE  
CARNEGIE MELLON UNIVERSITY

# ACCELERATE RESKILLING PEOPLE

## WHAT TO DO FOR TOMORROW, TODAY

The Fourth Industrial Revolution contributed to an imbalance in the global economy. New jobs are being created that require skills that don't yet exist at scale. Companies need to increase the speed of reskilling. Positioning their organization, and their people, to win in this newest revolution. Or risk leaving entire generations of workers without work or the skills to acquire it, destabilizing the lives of individuals and society at large.

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**1 Reskill at the top of the house:** Preparing the workforce for digital doesn't exclude the higher echelons of the organization. Accenture research shows a general shortage of technology experience in boardrooms: Only 10 percent of board members surveyed report having professional technology experience.<sup>15</sup>

And they need new leadership skills to lead in an era of technology disruption. Specifically: the ability to manage in horizontal not hierarchal ways; the ability to demonstrate intellectual curiosity; and the ability to go beyond "measurement and management" to inspire creativity and new ways of thinking.

- 2 But keep building on what you have:** Increasingly, US telecoms provider AT&T found itself facing a skills gap when it came to technology. The company lacked talent in cloud-based computing, coding and data science. To close the gap, AT&T launched “Workforce 2020” aimed at reskilling 140,000 staffers for new roles. (The company also set out the expectation that roles will change every four years.) In one four-month period, employees who had undertaken retraining filled half of all technology management roles at AT&T and received 47 percent of all promotions in the technology organization.<sup>16</sup>
- 3 Change the mindset to “learning as a way of life”:** This shift in behavior from point-specific training to lifelong learning makes workers and organizations nimbler. Readily adaptable to volatile markets. It could be argued that lifelong learning is the most critical skill to impart: OECD evidence shows that 65 percent of children today will do jobs that haven’t even been developed, underscoring the need for a highly adaptive workforce.<sup>17</sup>
- 4 Use digital to learn digital:** Not only are digital technologies good teachers, but there are a wide range of digital tools that can be paired with workers’ learning styles, circumstances and environments. From MOOCs (massive open online courses) to wearable technologies that enable real-time learning at the point of need. Take Airbus as one example of wearables: The company recently launched a program that will equip workers on the A330 Final Assembly Line with the most advanced mobile and wearable devices to support them in their daily work, increasing productivity, improving quality of service and ultimately generating significant savings.<sup>18</sup>

# REDESIGN WORK TO UNLOCK **HUMAN POTENTIAL**

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The demographics, attitudes and physical composition of the workforce have changed thanks to digital. Workers and workplaces need to become more relevant. More adaptive. Leaders need to harness these shifting dynamics in order to win the latest revolution. (See sidebar: “Creating the hyper-personal workforce experience.”)

For starters, leaders need to preserve the knowledge held by their more seasoned workforce, which is massive: A stark reminder of our aging population, people aged 65 and older will outnumber children under the age of five for the first time in history by 2020.<sup>19</sup> Leaders need to safeguard the knowledge of these wisdom workers within while on-boarding their newer talent pools. The Millennials down to Gen Z. In less than a decade from now, Millennials will make up an astounding 75 percent of the workforce.<sup>20</sup> And the first wave of the Gen Z generation, born in 1995 or later, is starting to enter the workforce. It’s a generation that makes up the third-largest segment of the U.S. population (22 percent).<sup>21</sup> Their characteristics: Gen Z is the most diverse generation in U.S. history. They have the shortest attention span (an average of eight seconds).<sup>22</sup> And are the world’s first true Digital Natives.

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## **CREATING THE HYPER-PERSONAL WORKFORCE EXPERIENCE**

Instead of operating in a traditional hierarchy, game developer and distributor **Valve Corporation** allows employees to pick and choose the projects they work on based on their interest and skill level in a flat organization. Work is completed in small, independent, multi-disciplined and project based teams.<sup>23</sup>

**Deutsche Bahn (DB)** is turning to virtual reality to recruit talented workers to replace its older workers transitioning into retirement. DB invests in technology to differentiate itself from rival firms. Alongside targeted recruitment campaigns on Facebook, a music streaming blog to appeal to graduates and the development of an applicant tracking system simplifying the online application process, DB uses VR so candidates can “test drive” jobs before they apply.<sup>24</sup>

**Mercedes-Benz** wanted to be a first mover in automating assembly lines. But because of the demand for hyper-personalization, robots couldn’t keep up with the rapid pace of change and the complexity of the customization options. While skilled humans can change a production line in a couple of days, robots take weeks to realign. Because of the underperformance of their robots, the company is giving people a greater role in industrialization again and aims to halve the time taken to produce a car from 2005’s benchmark of 61 hours to 30 hours. The lesson: Approach automation carefully. Think augmentation. And consider what kind of work is best suited for man versus machine.<sup>25</sup>

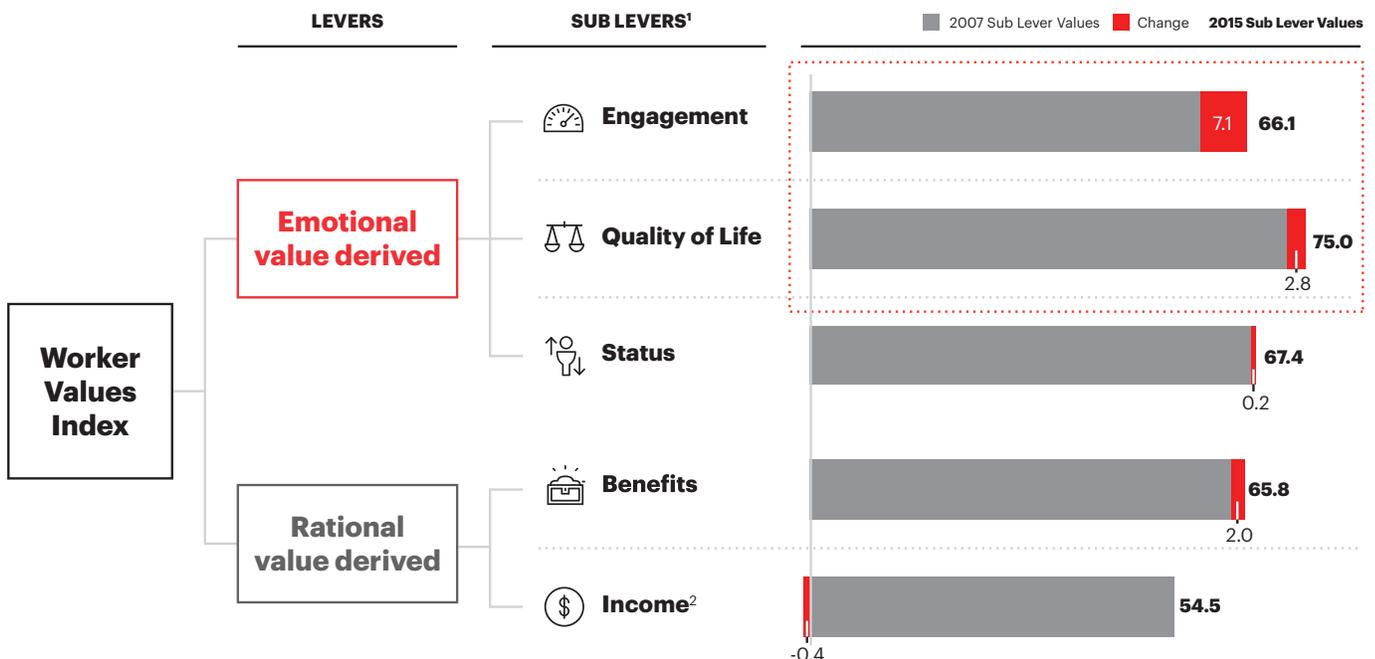
**“If your company is not obviously the “it” place to work, then you better figure out what to do to make it compelling for highly marketable people to work there.”**

Chip Joyce  
CHIEF EXECUTIVE OFFICER, ALLIED TALENT

Millennials are already the largest group (34 percent) in the U.S. workforce.<sup>26</sup> With this rising talent wave comes a new value system. And a new way of measuring outcomes. And unlike their parents’ generation, today’s workers don’t want to be “company men and women.” They want greater flexibility and autonomy. And are seeking learning opportunities. And will switch employers to get them. How long will they stay with one company? More than half of all employees say they expect to stay with their current employer for five years or less.<sup>27</sup> A figure that increases to 63 percent for Millennials.<sup>28</sup>

Their attitude toward remuneration has also evolved. Today, the employer/worker covenant goes beyond a binary equation of hours worked for a paycheck. Paychecks are a factor, of course, but so are a large variety of non-cash compensation components including ongoing education. The Accenture Worker Values Index reveals that emotional factors like engagement, quality of life, and status are equally if not more important to workers than income and benefits<sup>29</sup> (see Figure 4).

**Figure 4**  
Workers have more motivations beyond remuneration.



Sources: Gallup Analysis, Gallup World Poll Data, Accenture Analysis; Numbers may not add up due to rounding. Notes: <sup>1</sup>Countries – US, UK, Germany, France, Japan, Australia. Values are an average of six countries in scope. All sub-levers have been weighted equally to build the WVI. <sup>2</sup>Income represents household income.

These are the attitudes of a new workforce: a flexible, adaptive pool of talent. Some of them will be full-time employees and sit within the four walls of an organization. Others will be contingency workers, brought in at speed for specific needs.

What they both have in common: A desire for less structured roles and more “gig” approaches—work based on specific projects. It’s a trend recognized by top management: Seventy-nine percent of executives agree that the future workforce will be structured more by projects—work focused on joint goals completed in collaborative teams—than by job function.<sup>30</sup>

Survey results show that a full 67 percent of workers want to pursue self-employment or freelance opportunities in the future.<sup>31</sup> (See sidebar: “Adaptive Workforce.”) Executives see this shift coming. They anticipate that 44 percent of their workforce will include independent contractors or temporary positions by 2018.<sup>32</sup> Permanent employment status is no longer the rule. Among countries with available data, just over one quarter of workers are employed on a permanent contract. In addition, 13 percent of employees are employed on a temporary or fixed-term contract.<sup>33</sup>

## **ADAPTIVE WORKFORCE: GENERATIONAL, GEOGRAPHICAL, SKILL LEVEL DIFFERENCES**

According to a labor study by Accenture, the adaptive workforce is gaining strength, forever changing the worker/employer relationship.<sup>34</sup> Here’s a snapshot of the results:

### **Emerging vs. developed**

- In emerging economies, a full eighty-six percent of respondents are interested in freelancing.
- Fifty-nine percent of employees in developed countries view freelance work as an interesting option.

### **Younger vs. older**

- Seventy-six percent of Millennials are interested in freelancing, compared to 64 percent of Gen X and 53 percent of Baby Boomers.

### **Skill levels**

- Seventy-five percent of highly skilled respondents are interested in freelancing, compared to 69 percent of mid-, and 57 percent of low-skilled respondents.

**REDESIGN  
WORK  
TO  
UNLOCK**

# **HUMAN POTENTIAL**

**WHAT TO DO FOR TOMORROW, TODAY**

**Like changes of any magnitude, the effects of the Fourth Industrial Revolution are being felt deep within the internal workings of organizations. Down to the operating model. Responsive and responsible leadership will shape an ecosystem to pivot to the needs of individual workers. Instead of seeing shifting workforce dynamics as an erosion of the employer/worker covenant, they'll view it as an evolution, and respond accordingly.**

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- 1 Create a more flexible workforce model:** Rigid, formal job structures do not support the speed and agility demands needed in the face of digital innovation. Redefining and co-creating employment opportunities through more responsive role-based and gig-like work is a reality. These opportunities need to be available to both full-timers and freelancers.
- 2 Embrace collaborative design:** Rapid experimentation trumps designing and piloting. Instead of trying to get the entire organization to move to new practices, test them “on the fringes” and keep them away from the institutional culture whose immune system will squash them. But support that fail fast culture with new digital ways of working. Like collaborative design. Or crowdsourcing. Unleashing both in advance of rollout to gauge the likely impact of change.

**3 Enable change through ecosystems and platforms:** Savvy organizations will create physical and virtual networks to facilitate community building, deliver access to valuable skills training, generate feedback and create access to potential new roles and projects. And ultimately allow companies to rapidly tap into new sources of talent when it's needed. LinkedIn's educational platform, Lynda, allows point-of-need desktop training. JOLT is a self-described online marketplace that offers companies access to virtual and video-based learning delivered by recognized industry professionals on a variety of topics, providing just-in-time skills "jolts" to individuals and teams when and where they are needed.<sup>35</sup>

**4 Tap into boomers for a knowledge boost:** Tap current wisdom workers and recently retired executives to coach new talent coming up through the ranks. They still know more about many parts of your business than anyone if you can create a culture that respects and even celebrates different contributions from different generations. It's an increasingly popular tactic. In fact, according to the Society for Human Resource Management, eight percent of 463 companies surveyed had these programs.<sup>36</sup> And they are on the rise.

# STRENGTHEN THE TALENT PIPELINE FROM ITS SOURCE

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Changes wrought by the Fourth Industrial Revolution are widening the global talent shortage. A gap that will only worsen as advances in technology further increase existing talent mismatches. Accenture's research together with Girls Who Code reveals that in 2015, 500,000 computing jobs existed. But fewer than 40,000 computer science graduates were available to fill them.<sup>37</sup> Skill mismatch has a negative impact on labor productivity. Reducing skill mismatch has shown to deliver a boost in efficiency of about 10 percent.<sup>38</sup>

The dearth of skills goes beyond the STEM (science, technology, engineering and math) skills needed in the digital era. While those will continue to be critical, technical jobs at all skill levels require more than purely technical skills. Consider software engineers: This is a role that requires creativity, collaboration and business savvy. The so-called "human skills." Accenture Research analysis of O\*NET data from 2011 to 2014 reveals that demand for skills has changed considerably, with an increased emphasis on uniquely human skills.<sup>39</sup>

**"We need to work with the business to understand their talent needs and get ahead of what the future workforce looks like. That requires a different set of skills, a different set of training, a different type of recruiting, and it's going to require people coming in that are digitally curious."**

Andrea Smith  
CHIEF ADMINISTRATIVE OFFICER, BANK OF AMERICA

Creativity, critical thinking and empathy are now more important for all workers to operate at the pace of change, contributing both to their companies' growth and to their personal satisfaction. In fact, between now and 2020, WEF anticipates a growing skills demand for cognitive abilities (52 percent), systems skills (42 percent) and complex problem solving skills (40 percent).<sup>40</sup>

All of this should be a concern for leaders and an opportunity for responsive and responsible leaders. After all, the root cause of skills gaps reaches far back into the ecosystem to include primary and higher education. Even vocational training programs are producing workers with inadequate skills at worst. And at best, skills that become irrelevant before reskilling can even happen. There are many reasons for this: from silos that exist among talent pipeline participants to the inflexibility of the education system to change what and how it teaches. This leaves workers starting from behind and having to play catch-up.

**“With inadequate foundational skills provided in school, the fundamental skills gap starts at a young age itself, and only gets worse over time.”**

Virginia Hamilton  
REGIONAL ADMINISTRATOR  
UNITED STATES DEPARTMENT OF LABOR

# STRENGTHEN THE TALENT PIPELINE FROM ITS SOURCE

## WHAT TO DO FOR TOMORROW, TODAY

**Businesses may not be the cause of the talent pipeline problem, but like workers themselves, they experience the brunt of its effects. And although reskilling within their own organizations and ecosystems is critical, leaders need to do more to influence change at the source. Public-private partnerships and platforms are one way of addressing the gap at its root cause.**

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- 1 Foster national and cross-border programs:** In 2015, France forged a partnership between Pôle emploi, the National Labor Agency, and OpenClassrooms allowing free access to MOOCs. Jobseekers can access hundreds of online courses in everything from web development to digital art.<sup>41</sup> Through SkillsFuture Singapore, the Singaporean government has taken an active role in developing its citizens and facilitating lifelong learning by providing those over the age of 25 with a US \$500 stipend for their professional development.<sup>42</sup> Or take The Global Apprenticeship Network, GAN: The organization bands together companies, associations and other international organizations to promote quality apprenticeships. One of their remits is to create job opportunities for young people by aligning skills to business demand.<sup>43</sup>

- 2 **Bring personal influence to bear on industry groups:** By banding together, companies can wield greater influence. Take NASSCOM for example. It's India's engineering industry group that's helping the public sector create new courses on data science and analytics, automation and internet of things (IOT) in academics.<sup>44</sup>
  
- 3 **Collaborate with academia:** Influence the academic agenda from the beginning—and not just in engineering programs. That includes higher education, community colleges as well as non-degree programs. Accenture teamed with Harvard Business School and Burning Glass Technologies in the United States to develop recommendations for employers as well as academia and policy makers to plug the gap in U.S. “middle skills” jobs, those that require more education and training than a high school diploma but less than a four-year college degree.<sup>45</sup> Leaders need to work with other employers in their sectors to define common skill requirements and actively communicate them to local educational institutions.

# LEAD TODAY REACH TOMORROW —NOW

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According to a 2015 study by INSEAD, there's a clear and compelling correlation between talent competitiveness and the strength of a country's economy.<sup>46</sup> Society is now faced with an unprecedented situation: where a huge swath of the population runs the risk of being rendered irrelevant. Unemployable. Consider the destabilization potential of that scenario. And the cost to people who strive, through work, to make life better for their families, and for those around them.

To pave the way forward to a brighter future, leaders need to shape the workforce of tomorrow, today. They need to take action on three fronts: Accelerate reskilling people, redesign work to unlock human potential, and strengthen the talent pipeline from its source. Responsively and responsibly. Doing so will help leaders redefine competitiveness and give them an edge for decades to come. But first they need to change the parameters of "business as usual."

## WINNING LEADERS WILL:

### ACCELERATE RESKILLING PEOPLE

**Make every leader a digital leader:** Reskilling should involve all levels of the organization. From bottom to top. Today's leaders need to understand both business fundamentals and the power of new technologies. They also need to be "digital architects," equipped with a new set of attributes that enables them to succeed in a disruptive environment.

**Live the example of open source:** Strike the right balance between protecting your corporate DNA and offering the broader workforce access to learning resources. When all future talent is more capable, your business has access to a stronger talent pool, and is in a better position to compete in changing industry landscapes.

### REDESIGN WORK TO UNLOCK HUMAN POTENTIAL

**Tackle labor policies:** In an environment where the average worker will move on within five years, and where more and more people eschew traditional full-time employment, it's time for labor policy to change. Becoming more flexible to accommodate an adaptive workforce. Leaders can influence their own organizations readily enough. But also need to exert their influence on public policy through lobbying groups and industry advocacy.

### Good things come to those who wait:

Employee relationships used to be for the long haul. And the economics underpinning the decisions that drove workforce investments were based on that assumption. Now the workforce is churning. Adaptive. And in an ecosystem where even after they leave, they'll likely be connecting in some way back to their employer. Employers need to invest in training based on a new, less direct organizational payoff.

### STRENGTHEN THE TALENT PIPELINE FROM ITS SOURCE

**Become good stewards of the future.** Make developing tomorrow's talent a strategic priority for your business. Take responsibility for the next generation of workers by collaborating with organizations, academia and governments to identify future talent needs and cultivate the future workforce today. Leaders can reach further back into the talent pipeline to reframe education systems themselves, playing an active role in shaping curricula suited to the world of work.

# THE WAY FORWARD

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The Fourth Industrial Revolution brings with it a raft of issues when it comes to the workforce. At times the path ahead feels more like a tunnel—dark, uncertain—than a clearly lit road. But today’s responsive and responsible leaders have a way forward—the opportunity and means to navigate this tunnel through a combination of social and economic actions. Ensuring their people don’t get left behind when it comes to entering this brave new job market. Redesigning work to allow people and technology to reach their full potential. Harnessing this revolution to create the future workforce. Today.

**“Our ageing workers know the mines and our young guys know digital. When we have been able to have a cohesive cross-generational team, it has been stellar.”**

Duncan Wanblad

CHIEF EXECUTIVE OFFICER, BASE METALS AND MINERALS, ANGLO AMERICAN, SOUTH AFRICA

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# ABOUT THE RESEARCH

Accenture combined quantitative and qualitative research techniques in order to analyze how responsive and responsible leadership could help create the future workforce. The research program is built on the following three pillars, complimented by extensive secondary research and in-depth interviews with leading experts from universities, start-ups, large corporations and government organizations

## 1. SURVEY

A survey of more than 10,000 workers in ten countries seeking to establish opinions across skill levels and generations on the impact of technological advances on work today and in the future and how prepared the workforce is to upskill to respond to the opportunities and challenges presented.

### a) Methodology

- Accenture conducted a global opinion survey of 10,527 workers across skill levels and generations in 10 countries around the world: Australia, Brazil, France, Germany, India, Italy, Japan, Turkey, United Kingdom and the United States.
- Skill levels (high, medium and low) were organized by occupation categories from the U.S. Bureau of Labor Statistics, with slight modifications based on education level for specific occupational categories.
- The survey was constructed to ensure a representative sample of the employed population in each country in terms of age.
- The survey was executed online from 25 November to 9 December 2016 and was executed by Market Knowledge Online.

## 2. ECONOMETRIC MODEL

The model is used to identify the portion of employment subject to automation under different assumptions of the “state of skills” in the workforce, leveraging an estimated inverse relationship between the importance of skills that run with the machine and time allocation to “human-like” tasks within occupations, on the one hand, and the probability of automation, on the other. This analysis is based on today’s state of technologies.

In particular, we make assumptions around the pace of re-skilling of the workforce in the future towards run with the machine skills, we estimate the reallocation of working time to human-like tasks and we analyze the reduction in learning years needed by the workforce of the different countries in the sample to be ready to “run with the machine”.

### a) Methodology:

- Country-specific analysis for Germany, the United Kingdom and the United States
- Data basis: O\*NET data base, OECD PIACC survey, the work of Frey, C. B., & Osborne, M. A. (Oxford University), combined with the work supply demographics of the individual countries derived from the respective national account statistics on employment

### • Four step approach to the Modeling:

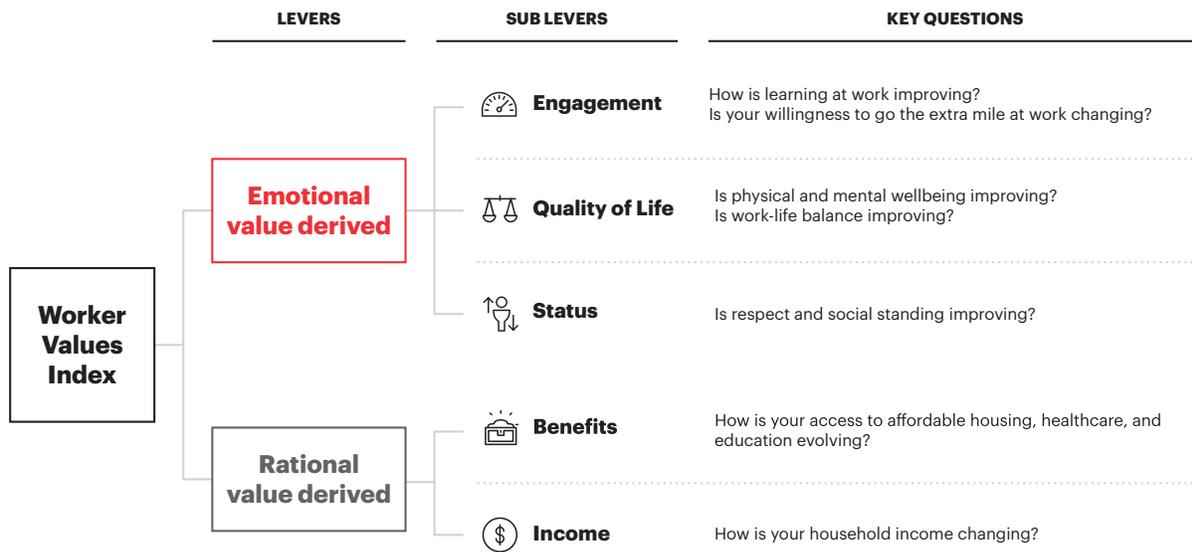
1. Constructed consistent data that links automation probabilities, skills, job activities, job descriptions and employment data
2. Defined those job activities that require strong human-like skills (that are not automatable) through regression analysis
3. Computed the share of employment in each country that is subject to total automation (= more than 75 percent probability), based on econometrics to estimate how the automation probability depends on PIACC activities of employees
4. Simulated the impact of learning on the portion of employment subject to total automation in a scenario-analysis, re-computing automation probabilities at different points in time, depending on (i) the extent to which respective activities are related to human-like skills and (ii) if the 2011-2014 CAGR evolution of human-skills were extended into the future

### 3. WORKER VALUES INDEX

Accenture’s Worker Values Index (WVI) reveals what motivates individuals at work, examining both rational and emotional factors. The Index measures the value individuals derive from work, with the understanding that work provides both tangible and intangible benefits. Created in partnership with Gallup, the WVI takes a well-rounded view of the worker as a “whole person.”

#### a) Methodology

- The Index consists of two levers (rational and emotional factors) and five sub-levers as per the graphic below:



- The country scope includes six developed markets: Australia, France, Germany, Japan, the United Kingdom and the United States
- Workers have been categorized across three skill levels – high, medium, and low
- Data on the sub-levers was retrieved from the Gallup World Poll, captured for the time period of 2007 to 2015. For sub-levers that include multiple component questions, an average across an individual’s responses was used to calculate the individual’s score on the sub-lever.
- Calculation of the WVI: An equal weighting approach across the sub-levers was used.

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