WORKING TOWARD AN INCLUSIVE FUTURE OF WORK IN THE DIGITAL ECONOMY

Imagine that you are a medical transcriptionist, responsible for converting voice-recorded medical records into written documentation and correcting errors made by speech-to-text software. One day, your supervisor introduces an advanced voice analysis program with machine-learning capabilities. With each correction you make, the software's accuracy improves. Over time, your job changes to include new tasks that require a different set of skills, but you have not had the opportunity to pursue on-the-job training. This is the only job you've ever had, and you're not sure you can make the transition. You have limited savings and significant family responsibilities. How do you navigate this challenge?

This is the experience of one worker we interviewed in the US who had to develop new skills in response to technological change. Stories like hers are becoming increasingly common.

Today, intelligent technologies—such as Analytics, Big Data, Cognitive Artificial Intelligence (AI) and Robotics—are reshaping work and redefining which skills are in demand across industries and geographies. There is a huge opportunity for workers to learn new skills and for businesses to create more value. In fact, by 2022, AI alone could increase revenues by 38 percent and employment by 10 percent.[1]

However, a skills gap makes capitalizing on this opportunity challenging. Workers will need technical and digital skills, complemented by unique human skills, such as empathy, communication and problem solving, to thrive in the digital economy.[2] Yet 60 percent of employers think that less than 25 percent of their workforce is ready to work with new technologies and machines.[3]

This report focuses on workers facing a double disadvantage—a higher risk of technological disruption from automation and fewer resources to embrace new career pathways. How can we support these workers as they make this transition?

At Accenture, we are dedicated to creating **"new skilling"** pathways for an **inclusive future of work**—a future in which all workers have the motivation, means and opportunity to thrive in the digital economy. To this end, we are collaborating across Corporate Citizenship, Human Resources, our Talent & Organization practice, and our Innovation Architecture to close current knowledge and action gaps in communities around the world.

To achieve our vision, we used a worker-centric approach, blending data and design to create a practical blueprint for an inclusive future of work. Through this process, we found that a change in mindset is fundamental to making a successful career transition. Resources such as time, funding and training courses are not enough. Workers also need to understand their options and have the confidence to act. This requires resilience and the ability to let go of an old professional identity and embrace a new one.

Keeping this mindset change at the forefront, we identified four actionable **solution spaces**—sets of workforce interventions that we believe will be critical for workers to navigate their transitions ahead.

These solution spaces can support workers to...

ENVISION career pathways built on strengths and the confidence to get there

EXPAND access to relevant training inside and outside of work to future-proof skills

EXPERIENCE new roles and add to work history by putting skills into practice

EMPOWER themselves and each other to pursue lifelong learning through mutual support, mentorship and peer-to-peer learning

THE AGE OF "NEW SKILLING"

We refer to "new skilling" rather than "reskilling" because skillbuilding is additive. We aim to provide workers with new skills to supplement their existing expertise, rather than discredit or discount what has already been learned.

To achieve broad-based change in how workers, employers and workforce development organizations approach learning, training and hiring, we need cross-sector collaboration. We invite employers and workforce development organizations to join us as we embark on a journey to design, develop and pilot new skilling solutions. By establishing creative partnerships, testing new approaches and sharing best practices, we can forge an inclusive future of work.

Thank you,

Lisa Neuberger-Fernandez
Managing Director,
Accenture Corporate Citizenship

Christopher Chu
Managing Director,
Accenture Strategy

Allison Horn
Managing Director,
Accenture Leadership & Learning

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OUR VISION
FOR AN INCLUSIVE FUTURE OF WORK

We envision an inclusive future of work, where all workers have the motivation, means and opportunity to adapt to and thrive in the digital economy.

This report focuses on workers facing a double disadvantage— those who are most likely to experience technological disruption from automation yet have fewer resources to transition to new career pathways.

To prepare these workers for tomorrow's jobs, we need solutions that address the unique challenges they face.

To define solutions, we took a worker-centric, action-oriented approach:

- Modeled the proportion of time workers spend on automatable and augmentable activities across seven countries, with a detailed look at the susceptibility to automation;

- Interviewed more than 30 experts in intelligent technologies, and learning and workforce development;

- Interviewed almost 60 workers who perform a high proportion of routine activities in less complex roles;

- Conducted a scan of ~200 skilling organizations and identified a selection of new skilling pioneers demonstrating best practices in the space;

- Analyzed survey data of more than 1,200 employers and 14,000 workers; and

- Ran a series of design thinking workshops at The Dock (a design-led, multidisciplinary research and incubation hub) in Dublin, Ireland with leaders from Accenture Labs, Fjord, our Talent & Organization practice, and the Human Resources and Corporate Citizenship functions.

For more details on the methodology, see **Appendix II**

SETTING THE SCENE: WHICH WORKERS ARE MOST VULNERABLE?

While intelligent technologies will impact the entire workforce, this report focuses on workers who:

- **Are more likely to face disruption by automation.** The biggest change will be felt by workers in less complex roles, which consist largely of routine tasks and typically require only primary or secondary education. These workers face a greater likelihood of extensive change to the content of their job.[4]

- **Will face a double disadvantage.** These workers have a limited financial safety net,[5] lower job security,[6] lower proficiency in high-demand skills[7,8] and unequal access to training.[9] This makes career transitions more difficult.

- **Require proactive support.** New skilling is a nascent space. Further action and investment is needed to better support workers' transition to the digital economy. Today's skilling ecosystem focuses on the unemployed or those entering the workforce for the first time, rather than those at risk of becoming unemployed. In addition, today's skilling programs tend to emphasize immediate vs. future skilling needs.[10]

Workers carrying out routine activities are more likely to face disruption due to automation

Intelligent technologies—including Analytics, Big Data, Cognitive Artificial Intelligence (AI) and Robotics—are reshaping the future of work, automating routine tasks and augmenting activities that involve social/emotional or high-order cognitive skills (see Figure 1).

Workers in entry-level or mid-career jobs where a high proportion of time is spent on routine, automatable activities will experience the biggest change.
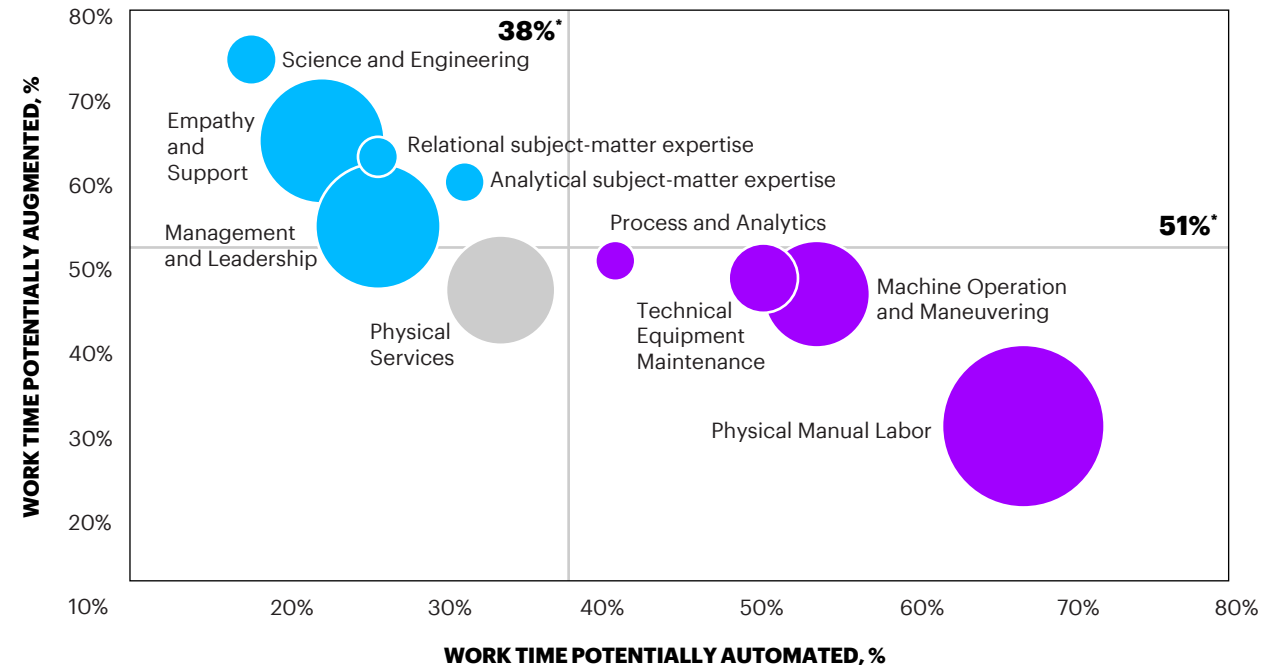
AUTOMATABLE VS. AUGMENTABLE ACTIVITIES

Automatable activities can be replaced with technology that does the same thing, perhaps even more quickly and cheaply.

Augmentable activities can be improved upon through human and machine collaboration.

Figure 1: Percentage of Workers' Time Potentially Augmented or Automated by Intelligent Technology, by Role Cluster, average across Brazil, France, Germany, Japan, South Africa, UK and US (%).[4]

DISTRIBUTION OF WORKER TIME ACROSS AUGMENTABLE AND AUTOMATABLE ACTIVITIES, BY ROLE CLUSTER

*Average percentage of workers' time potentially augmented / automated for sample of countries
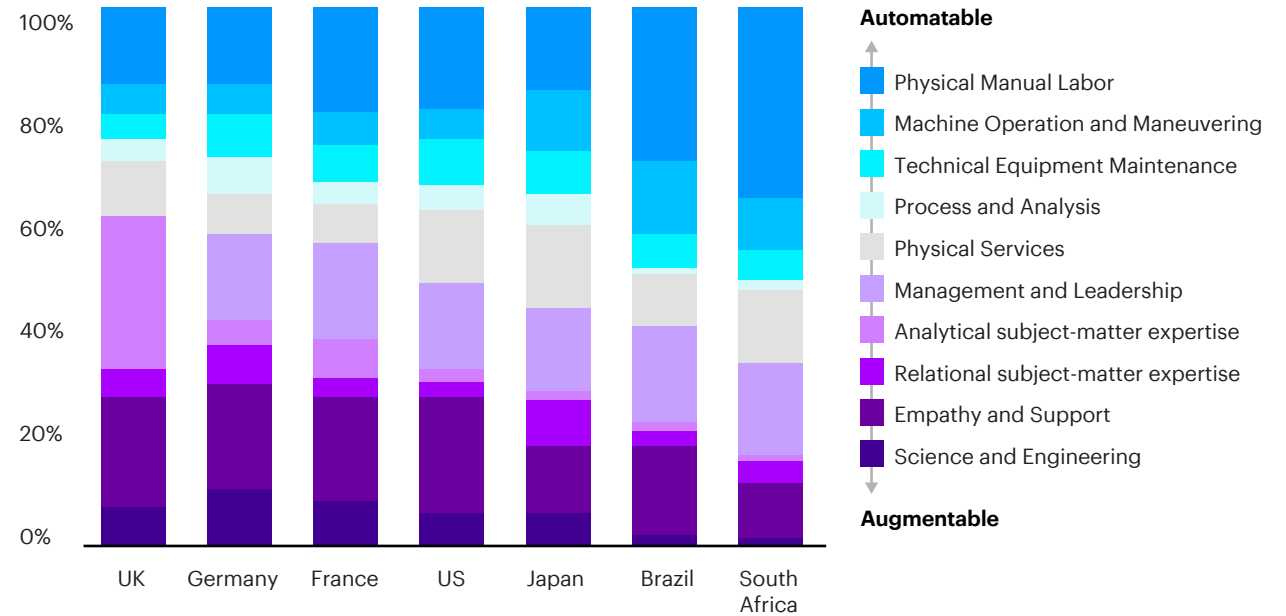
● Highly augmentable activity   ● Human-centered activity   ● Highly automatable activity

The extent to which intelligent technologies will impact the workplace differs significantly across countries, due to economic structure, workforce distribution across different roles and the time spent on routine vs. non-routine tasks (see Figure 2).

In countries with a large services sector, the majority (up to 62 percent) of workers are in roles that consist largely of tasks that will be augmented by technology. In contrast, a large proportion (up to 52 percent) of the labor force in developing countries with large extraction and production industries occupies roles consisting largely of automatable tasks.

Figure 2: Distribution of Employment by Role Cluster, by Country (%).[4]

DISTRIBUTION OF EMPLOYEE BY ROLE CLUSTER, ALL ROLES

Automatable

- Physical Manual Labor
- Machine Operation and Maneuvering
- Technical Equipment Maintenance
- Process and Analysis
- Physical Services
- Management and Leadership
- Analytical subject-matter expertise
- Relational subject-matter expertise
- Empathy and Support
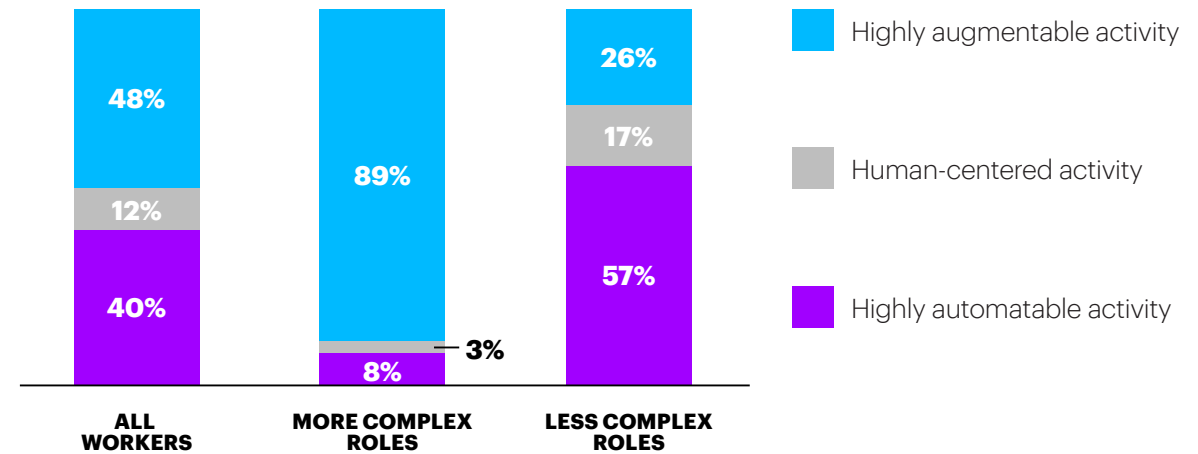- Science and Engineering

Augmentable

Workers in less complex roles, which consist of routine activities and typically require only primary or secondary education, are more likely to be impacted by automation. More complex roles typically require post-secondary education and are more likely to be impacted by augmentation. Across countries, 57 percent of workers in less complex roles (see **Appendix III**) spend a significant proportion of their time on automatable tasks, while the same is true of only eight percent of workers in more complex roles. Meanwhile, 89 percent of workers in more complex roles spend most of their time on augmentable tasks, compared to only 26 percent of workers in less complex roles (see Figure 3).

Youth are more likely to be in less complex roles with a high proportion of time spent on routine activities, increasing their likelihood of disruption due to automation. The OECD argues that it could become more difficult for youth to enter the job market.[11] However, mitigating factors make the impact less clear-cut. Youth may have a smoother transition due to better technology skills (in most countries),[12] increased likelihood of having participated in training in the past year[13] and greater availability of internship and apprenticeship schemes.[14]

Figure 3: Proportion of Workers in Roles by Complexity (%), Average across Brazil, France, Germany, Japan, South Africa, UK and US.[4]

WORKERS IN ROLES WHERE MORE TIME IS SPENT ON...

Highly augmentable activity

Human-centered activity

Highly automatable activity

ALL WORKERS · MORE COMPLEX ROLES · LESS COMPLEX ROLES

The Double Disadvantage

Workers who carry out routine tasks in roles that typically require only primary or secondary education face four key challenges:

Limited Financial Safety Net

Workers without a post-secondary education earn less, reducing their ability to save and create a financial safety net. In fact, every three years of additional education increases earnings by approximately 14 percent.[15]

Lower Job Security

Workers without post-secondary education are more likely to be in unstable working conditions; that is, involuntarily unemployed or on temporary contracts.* A study of 35 countries by the Organization for Economic Co-operation and Development (OECD) found that 83 percent of people with tertiary education, 74 percent with upper-secondary and post-secondary non-tertiary education, and just below 56 percent without upper-secondary education are employed.[16] The International Labor Organization (ILO) also found that women, youth and workers in occupations that do not require a bachelor's degree are more likely to be on temporary contracts, which traditionally pay less.[17] As a result, these individuals may not have the time, support or financial means to develop new skills or seek new work opportunities.

Lower Proficiency in High-Demand Skills

As technology changes the nature of work, in-demand skills also change.[18] Workers will need technical and digital skills, complemented by soft and cognitive skills, to thrive in the digital economy. In the US, eight in 10 middle-skilled jobs require digital skills,[19] while demand for soft skills has grown by 230 percent from 2010 to 2016.[20] In addition, a study by the OECD found that even in technology-rich contexts, cognitive skills—including reasoning, creativity and empathy—are just as important for problem-solving as technical skills, such as coding, testing and data management.[21] Meanwhile, workers with primary and secondary education often perform more poorly on core skills such as literacy, numeracy and problem-solving compared to workers post-secondary education.[22]

Unequal Access to Training

Across OECD countries, only 17 percent of workers in low-skilled occupations participate in job-training each year, compared to an overall average of 40 percent.[23] While free online education is growing, access is unequal. The World Economic Forum found that most adult learners who enroll in massive online open courses (MOOCS) have a bachelor's degree.[24] This suggests that workers without advanced degrees, who significantly stand to benefit from such resources, are not currently aware of or accessing them.

* Temporary work, per the ILO definition, includes fixed-term, project- or task-based contracts, as well as seasonal or casual work, including day labor.

# Workers will need proactive support to new skill

New skilling is a nascent space. The skilling ecosystem—consisting of learning and training programs from workforce development organizations, employers, educators and government—does not currently support workers at the speed and scale needed to help them transition to tomorrow's career pathways. Job placement programs tend to focus on the unemployed or those entering work for the first time, rather than those at risk of becoming unemployed.[25]

Similarly, employers tend to focus on training for immediate needs, missing opportunities to prepare the talent pool for the future. For example, in the UK, evidence shows that training for older workers tends to center around their current role rather than wider developmental needs.[26] In addition, training opportunities are not equal across employers. For example, workers in small- and medium-sized enterprises participate in 50 percent fewer training activities than those at large enterprises, according to the OECD.[27]

Nonprofits also struggle to keep up. Squeezed budgets make it challenging for workforce development organizations to keep curricula up-to-date[28] as technology changes the in-demand skills. Our **New Skills Now: Inclusion in the digital economy** research lays out the six skills families, comprised of the digital, technical and unique human skills (such as empathy, communication and problem solving) that will be critical for workers to thrive in the digital economy (see Box 1). We found that despite the importance of a growth mindset for navigating career change, only one in 100 workforce development organizations analyzed offers training dedicated to nurturing this competency.[29]

While pioneers across business, the nonprofit sector and government are leading the way in shaping new skilling solutions, further action and investment are needed to better support workers.*

Box 1: New Skills Now Taxonomy: Skills Families Critical to Thrive in the Digital Economy
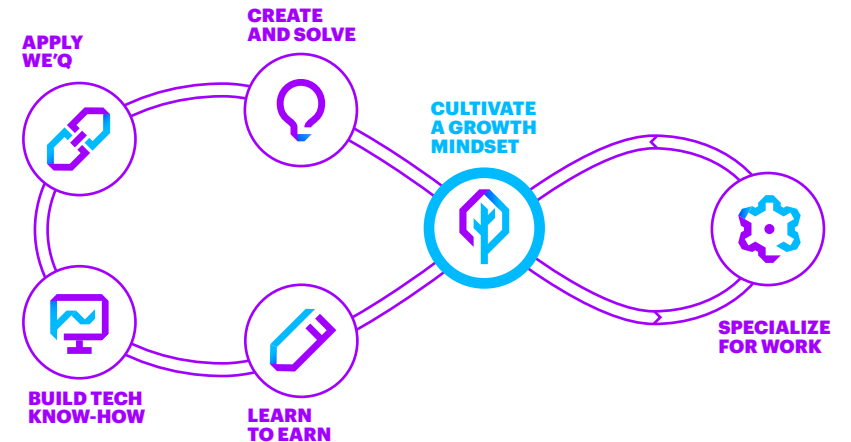
APPLY WE'Q
Skills to interact, build relationships and show the self-awareness needed to work effectively with others in person and virtually.

CREATE AND SOLVE
Skills to approach problem solving creatively, using empathy, logic and novel thinking.

CULTIVATE A GROWTH MINDSET
Skills to stay relevant, continuously learn and grow, and adapt to change.

BUILD TECH KNOW-HOW
Skills and know-how to use, manipulate and create technologies and data.

LEARN TO EARN
Foundational skills to get work and be ready for the workforce.

SPECIALIZE FOR WORK
Relevant skills to address local market priorities and industry needs.

* Selection of new skilling pioneers is outlined in **Actionable Solution Spaces for an Inclusive Future of Work.**
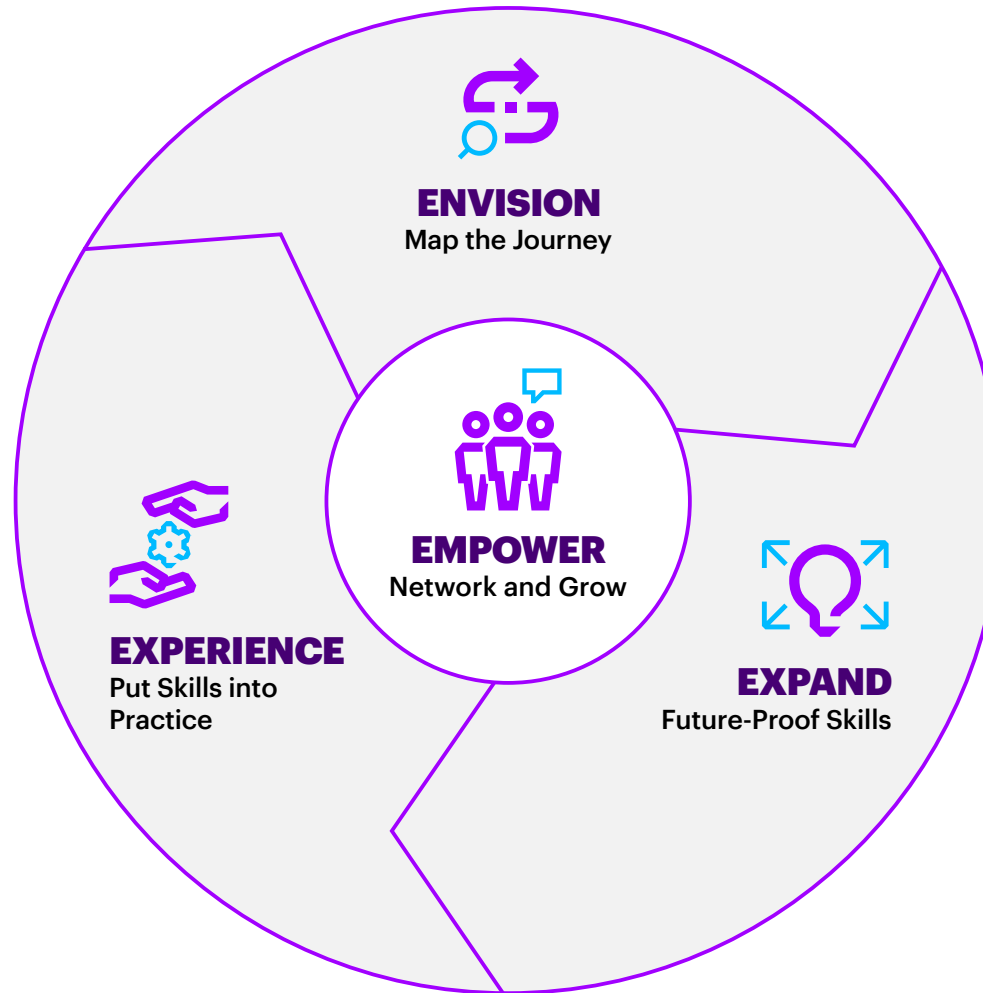
ACTIONABLE SOLUTION SPACES FOR AN INCLUSIVE FUTURE OF WORK

We developed a framework of four solution spaces—sets of workforce interventions (see Figure 4)—that we believe will be critical to support workers as they embrace new career pathways.

We found that for workers who carry out routine tasks in roles that typically require only primary or secondary education, reimagining and navigating the path forward is the most challenging part of career transitions. It requires learning and unlearning, letting go of one work identity and embracing a new one. We propose solutions that enable workers to **envision** career pathways built on strengths and the confidence to get there, **expand** access to relevant learning inside and outside of work, **experience** new roles and add to work history by putting skills into practice, and **empower** themselves and each other to pursue lifelong learning through mutual support, mentorship and peer-to-peer learning.

Figure 4: Four Solution Spaces for an Inclusive Future of Work, Accenture

ENVISION
Map the Journey

EMPOWER
Network and Grow

EXPERIENCE
Put Skills into Practice

EXPAND
Future-Proof Skills

HOW CAN WE SUPPORT WORKERS TO...

ENVISION career pathways built on strengths and the confidence to get there

EXPAND access to relevant learning inside and outside of work to future-proof skills

EXPERIENCE new roles and add to work history by putting skills into practice

EMPOWER themselves and each other to pursue lifelong learning through mutual support, mentorship and peer-to-peer learning

Investing in new skilling solutions would benefit workers, employers and workforce development organizations*:

- **Workers** would benefit from skillsets tailored to local demand, better access to opportunities and more appropriate job-fit.

- **Employers** would gain from a deeper talent pool, reputational benefits and improved scale of learning and training opportunities.

- **Workforce development organizations** would achieve improved outcomes for workers through strengthened employer relationships and improved longevity of impact.

In the upcoming pages, we outline the current skilling ecosystem and the challenges facing workers; paint a picture of what an inclusive future of work could look like; illustrate workers' possible journeys through personas that are rooted in our ethnographic interviews with workers; and highlight examples of organizations leading the way in the new skilling space.

* For more information see **Appendix IV**.

ENVISION

Map the Journey

Workers envision a different future in which they are exposed to new career options, learning pathways, types of support and resources, and peers who have successfully made the same transition.

Understanding Today

Workers need help envisioning and preparing for the future of work. Yet employers struggle to explain how and to what extent intelligent technologies will affect their workforce. This creates anxiety for workers, 37 percent of whom worry that their skills will become obsolete and 41 percent of whom doubt their ability to manage increasingly complex digital tasks.[30] In fact, only 34 percent of workers feel very confident in their skills and ability to work with intelligent technologies.[31]

Meanwhile, a lack of transparency around market demand contributes to limited visibility of opportunities. Governments rely on historical—at times outdated—data to identify growth industries.

While providers such as LinkedIn and Burning Glass offer services that use company-provided postings to identify the skills needed for specific roles, there are limitations. Such platforms do not typically provide consolidated information about which skills are growing in demand overall, and those that do tend to target companies, not workers.

Workers often struggle to articulate their strengths. They feel stuck in jobs that are disappearing, are unsure what skills they have or need to develop and lack the confidence to expand their job search to new kinds of roles and industries.

Box 2: Worker Voices from Ethnographic Interviews, Accenture Research

How will intelligent technologies impact me?

"It has not been explained to me what will change... A lot of my work is relational—dealing with people— if they switched that to robots... it would be odd... I would ask why".

Marketing Coordinator, US

Can I make a shift with my current skillset at this stage in my career?

"If I try to find something new, I will need to start from scratch. I will have to start from minus".

Construction Laborer, India

When and how should I start preparing for a job change?

"AI, robots that are coming in... they're not just hitting my industry, they're hitting a lot of industries. Especially accounting and financial services, so it's a little bit difficult to say what I'd go into. If I just go into another role it might be under the same sort of stresses".

Logistics Operator, Ireland

SEEING THE FUTURE: CAREER NAVIGATION IN 2023

KASSIM – UK, Age 38*

SITUATION
Assembly line worker for 10 years whose department has been restructured.

FAMILY
Married (Aisha), with one daughter.

MINDSET
Unclear about path forward.

ACTION
HR helps identify options using CareerSherpa, a data-driven tool that proposes new opportunities, learning and potential contacts.

OUTCOME
Gains motivation to act. Has a tangible path.

From 'what now' to 'here's how'

Kassim: Aisha, I've got some difficult news. I need to find a new job. The whole team does. We found out this morning.

Aisha: Oh, Kassim. What a blow! How do you feel? Are you alright?

Kassim: Strangely, I think I am. At first, I was sick with worry, what with Ella's childcare, the mortgage... But they've given us some notice and will be providing training.

Aisha: Training? But you hated school! And it's been over a decade since you last had to find a job. How'll you stack up against other younger, tech-savvier applicants? What will we do?

* Based on ethnographic interviews with ~60 workers across five countries

Kassim: I know it's tough. I kept wondering how I'd ever get another job. Who would hire me? What have I got to offer? But HR is helping. I met this woman named Mara from CareerSherpa after they told us about the restructuring. I thought we'd spend most of the time poring over my past performance reviews, but instead we had a nice, easy chat about my work. She asked questions about what I've done and enjoyed, while this small tile-like device listened in. *Then* it started showing me suggestions about what I could do next.

Aisha: Wow, sounds nifty! But… was it useful?

Kassim: It had some unexpected ideas. It suggested I apply for managerial jobs!

Aisha: Really? But you've never been a manager.

Kassim: That's what I said! But I always run the training for new joiners on the factory floor. Mara said that shows leadership and interpersonal skills, which does make sense. And I mentioned how I always help Jim with the work-plans.

Aisha: You do them for him, you mean.

Kassim: Exactly. So with a bit of training—which the Sherpa-tile mapped out—I'd apparently make a good manager one day! It also recommended other jobs that I could apply for sooner. Being a construction site foreman, for example, requires a lot of the same skills I've already demonstrated.

Aisha: Well, you *did* enjoy that one summer job on a construction site right after secondary school…

Kassim: And do you know how much site foreman pays? More than I'm getting now. Mara said there's going to be a lot of new construction happening around here— the CareerSherpa thing can predict what jobs are going to be in-demand based on all sorts of information, like live data from companies and local government… that kind of stuff.

Aisha: But won't you need qualifications?

Kassim: Yeah, I will, but we've been told we can all spend some time taking courses while we're working out our notice. Mara sent me a link with the details, along with an introduction to someone who's found a new job this way before. I'd like to read up on it more, and also update some of the information CareerSherpa captured from today's conversation to make sure I'm explaining myself and my goals well. But it all sounded doable!

Aisha: Will you need to train in the evenings? It'd be tricky, but I could try to trade shifts at work…

Kassim: Don't go to the trouble just yet. Apparently, the training is flexible; Mara said I should be able to fit it around our family schedule. Listen, everything's going to be alright. Let's get dinner started, and we can look at it together after the baby's asleep. I'm actually a bit excited. This may all work out for the best.

How Might This Work?

Imagine a world where every worker has access to innovative tools and approaches that help him or her map out future career pathways. These solutions would be designed to build confidence and emotional resilience, and to address the mental, emotional and technical challenges he or she might face when changing careers. Workers would be empowered to expand their horizons, look beyond familiar roles, envision new career paths and seek new skills at any stage of life.

These solutions help workers understand their own strengths and aspirations. They can also access and make sense of current and projected demand for jobs and skills, as well as estimate job fit by drawing on data from many sources: labor statistics, LinkedIn activity, news reports and even traffic data.

They could also:

- **Adapt** in response to changing needs and preferences;

- **Point out** interesting career destinations and different routes for getting there;

- **Inspire** by showing career paths other workers have pursued;

- **Adapt** to digital skill level; and

- **Recognize** potential learning barriers—such as disability or household instability—and look for workarounds.

These tools and approaches could be used by human resources functions, career counseling professionals or by workers privately exploring their options.

Ultimately, they could make future career options more visible—and thus inspire action—while helping workers understand what paths align with their skills, strengths and aspirations.

> **"A labor market focused on skills lets people show what they can do and learn, rather than being defined by a pedigree. It enables people to envision themselves in digital economy jobs; recognize their transferable skills; and pursue ways to keep learning as they actively navigate an ever-changing employment landscape."**
>
> **Beth Cobert**
> Chief Executive Officer,
> Skillful: An Initiative of the Markle Foundation

Pioneers Bringing the "Envision" Solution Space to Life

Bob Emploi

French start-up Bayes Impact created **Bob Emploi**, a digital service that uses algorithms based on data from the French Employment Agency to help job seekers find resources that best match their specific profiles. They assess a jobseeker's individual situation before providing personalized recommendations of viable employment strategies. Within their first year, Bob Emploi had reached 130,000 users, 42 percent of whom say the platform contributed to them finding a job.[32]

STEAMRole

US-based **STEAMRole** is a mission-driven company that connects job seekers to role models in STEAM (Science, Technology, Engineering, Arts, and Mathematics) fields through a mobile-based social network. It incentivizes participants to learn skills through a digital currency, RoleCoin.[35] It assists companies in inspiring diverse talent and tracking their credentials and progress as they acquire the necessary skills to be hired.[36]

Markle – Skillful

The Markle Foundation, a US-based nonprofit, developed Skillful: an initiative to help American workers and employers adapt to the digital economy. Skillful facilitates transparency around the value of educational and training programs and fosters the adoption of skills-based talent management practices to give educators a clearer picture of which skills are in demand in their area, businesses a better way of recruiting and assessing applicants, and job seekers a better understanding of potential career pathways. Since its launch in Colorado, nearly 600 businesses have been trained on skills-based hiring practices and more than 200 career coaches have joined an online community to learn from Skillful and each other. Skillful recently expanded with the creation of the Skillful State Network, a collaboration of 20 governors from both major political parties, to transform the US labor market to one that is skills-based. [33,34]

EXPAND
Future-Proof Skills

Employees and employers change their expectations of one another so workers receive the time, funding and support necessary to access lifelong learning opportunities.

Understanding Today

Many workers struggle to find the time, funding, motivation and support to pursue learning opportunities. Nineteen percent say lack of time is the biggest barrier to developing new skills,[37] and many sacrifice family needs to learn after-hours. Twelve percent cite the requirement to self-fund as another barrier. Mid-career workers from single-income households and/or with young children, aging parents or disabilities find it especially difficult to contemplate paying for tuition while reducing paid work hours.

When older workers get laid off or quit, it takes them far longer to get rehired.[38] However, older workers are less likely to participate in employer-led training activities.[39] Accenture research shows that participation in skilling declines with age.

While nearly half of all younger workers engage in developing new skills to advance their careers, only 35 percent of Baby Boomers do the same.[40]

Finally, employers in some geographies and sectors are reluctant to recognize skills from ongoing learning because there is often no accepted standard for credentialing, particularly across different industries.

Box 3: Worker Voices from Ethnographic Interviews, Accenture Research

How can I learn new skills while juggling my current job and family responsibilities?

"[Building] a career takes time and money. I don't have either".

Construction Laborer, India

What impact will formal learning of new skills have on my career?

"I think it's very difficult to know what advancements are going to happen in technology over the next period of time; to know exactly what skills we're going to require in the future to carry out our normal work".

Financial Services Advisor, UK

How can I get started with the right course for my skill-level?

"[With online learning,] the basics should actually be basic. [Instead] it presupposes a lot of knowledge".

HR Clerk, US

SEEING THE FUTURE: LIFELONG LEARNING IN 2023

TREVOR – USA, Age 51*

SITUATION
Accounting clerk for 25+ years whose tasks were automated.

FAMILY
Married, two children.

MINDSET
Surprised. Scared of learning.

ACTION
Accesses online learning tool provided by employer skilling fund ('loop fund'). Tracks credentials via blockchain.

OUTCOME
Transitions to sales role. Brings internal knowledge with him.

When onwards means upwards

Brandy: Trevor, thanks for coming in. I'm with HR. I want to learn about your experience transferring from accounting to sales, as we're looking to expand the training and redeployment program.

Trevor: Sure, happy to chat.

Brandy: Great. How did you find out about the opportunity?

Trevor: Our group's leadership team had a meeting and told us they would be introducing automation technology. They explained how it would change our jobs and gave us a few options to consider.

Brandy: And how did you feel when you heard the news?

* Based on ethnographic interviews with ~60 workers across five countries

Trevor: I was surprised… I didn't think I'd ever leave accounting, and I hadn't imagined doing anything else. But leadership reassured us that the company would help us make a switch.

Brandy: Tell me about how the transition worked.

Trevor: Well, for the first two months of training, I stayed on at the accounting department to help with the transition. Then, as I got further into the training and could put more of it into practice, I spent more time in sales.

Brandy: How did you find the training by Future Forge?

Trevor: It wasn't easy at first. I'm what my son calls "technologically challenged". But I was assigned a Forge Coach, Ann. She sat with me in person for the first few sessions. Then I could go at my own pace.

Brandy: Glad to hear it. What about the training content? Was it pitched at the right level?

Trevor: Some was, some wasn't. Ann arranged some sessions to bring me up to speed on marketing. I skipped the accounting courses but still had those skills verified on the, uh… the blockchain, was it?

Brandy: Exactly. It's what'll help us keep track of the full range of your skills going forward. Now, I hope you don't mind me asking—how did the financial side work out for you? Did you tap into the loop fund?

Trevor: Yes, the loop fund covered all the costs upfront, and I'm paying a portion back from my salary. In all honesty, I wouldn't have managed otherwise. I've got two kids in college, and my dad's in a nursing home. Losing my income would have been very difficult, and paying for the training would have been out of the question. When I've told friends that our company is using savings from automation to fund retraining, they've been very impressed—their employers don't offer that.

Brandy: Well, you were selected because your peers respect you and your previous manager thought you'd be a natural at building client relationships. I want to thank you for putting the hard work into the transition, I know it wasn't easy, but we're glad to have someone with your depth of organizational knowledge on board.

Trevor: I'm glad to have had the opportunity.

How Might This Work?

Imagine a world where the employer-employee relationship includes mutual investment in continued education. Learning is an integral part of roles, employers allocate sufficient time, space and funding for professional development, and nonprofits provide learning opportunities tailored to local market demand and conducive to developing a growth mindset.

This could be enabled by:

- **Creating curated pathways** that connect users with existing courses and articles for easily-accessible learning—provided at the right skill level, in the right quantities and at the right time to build high-demand skills in line with both workers' and employers' interests and short- and long-term needs;

- **Recognizing learning and training credentials** across employers and workforce development organizations;

- **Establishing learning accounts** that workers can draw on to develop new skills;

- **Incentivizing career development** based on demonstrated skills, by considering internal candidates on the same footing as new hires for open positions; and

- **Preparing workers** while they are still employed rather than after job loss has occurred.

Ultimately, employers would hire workers based on their skills profile rather than academic degrees. Employers would see a clear value case for skilling, and companies would develop innovative models that afford workers the necessary resources to access training. Workers would benefit from smoother transitions to new career pathways, as they would be more likely to find new work while still in employment, rather than after job displacement.

"**The future of work will see people working with data and digital applications. Job contents and job roles are expected to change more frequently than the past. Hence, it is critical to have a robust skills ecosystem to support all segments in the workforce for the continuous need for pre-skilling, re-skilling and deep-skilling. This skills ecosystem will need stakeholders to leverage on labor market insight, quality and outcome-based training programs, and individualized career-and-learning advisory to tailor to the diverse needs of people.**"

Soon Joo Gog
Chief Futurist & Chief Research Officer, SkillsFuture Singapore

Pioneers Bringing the "Expand" Solution Space to Life

GoodPaths℠

GoodPaths

GoodPaths, a US-based initiative developed by Goodwill Industries International and Hope Street Group with support from Walmart Giving, addresses talent retention and development challenges in retail.[41] Using a blended training model, GoodPaths provides beneficiaries with "Career Navigators" to help them manage their career path and identify opportunities for advancement. A web app delivers training content and allows coaches to track participants' progress.

SkillsFuture

The **SkillsFuture Movement** develops Singapore's social compact on skills. The Movement works alongside tripartite partners, education and training providers as well as strategic intermediaries to build a dynamic skills ecosystem to support pre-skilling, re-skilling and deep-skilling of individuals for the new economy. The range of support includes course fees subsidy, SkillsFuture Credit, work-learn program, and online-and-offline career and learning advisory services.[43,44]

Compte personnel de formation ('Personal Training Accounts')

French law grants every individual the right to a lifelong **personal training account** (CPF), from the time they first begin working. Employees accrue 24 hours (and 48 for non-qualified workers) per year (based on full-time employment; pro-rated for part-time work), which can be put towards government-certified training. Accumulated hours remain accessible even if individuals change employers or leave the workforce. Workers can accrue up to 150 hours over nine years, which can be supplemented by employers, employment agencies or the account holder. Businesses fund this benefit with a one percent tax on payrolls.[42]
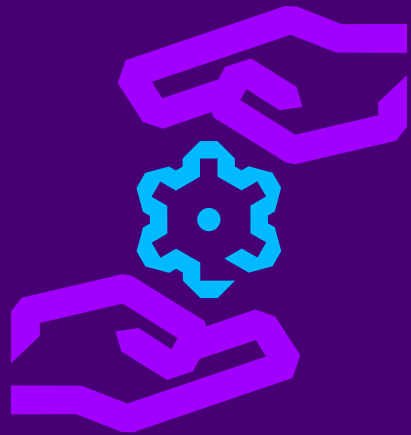
EXPERIENCE

Put Skills Into Practice

Enabling workers to build work history and 'test drive' new job opportunities through short-term work placements that provide real value to employers.

Understanding Today

Workers would benefit from on-the-job experiences to put skills into practice, test career paths and build work history. Yet these opportunities are often few and far between.

Despite the fact that workers without bachelor's degrees who participate in apprenticeship programs are as effective at certain jobs, such as billing and customer service, as those with bachelor's degrees,[45] many countries undervalue apprenticeships: England, France, the US and Ireland have 20 or fewer apprentices per thousand employed persons, compared to 40 or more in Germany, Australia and Switzerland.[46] This is largely due to a lack of awareness around the availability and benefits of job placements as a means to build career pathways, as well as employer preference towards hiring rather than training for skills.[47] Employers don't always recognize transferrable skills—particularly those that are not reflected on academic transcripts.[48]

Workers fear that taking short-term roles to gain on-the-job experience entails a pay reduction, at least in the short-term, with no guarantee of success. The perceived opportunity cost, in a context of financial insecurity, compels them to seek work within their existing areas of expertise, even as automation narrows the available opportunities in those areas.

Lack of role models is also an issue. Many workers do not pursue jobs they may be well-suited for because they do not see people like themselves in those roles. For example, only 13 percent of nurses in the US are men,[49] despite programs and marketing campaigns aimed at attracting more male applicants.[50]

Box 4: Worker Voices from Ethnographic Interviews, Accenture Research

How would I know if an opportunity is right for me?

"I would want to know whether it's something I really enjoy and would want to stick with, and whether it's something I can fit around my family".

Part-time Health Care Assistant, US

How can I show employers that my skills are relevant to them?

"Having the opportunity to 'test drive' a job would benefit candidates who might otherwise be overlooked because they don't have a degree and would also benefit companies because they'd be getting the advantage of having these employees on board".

Financial Services Advisor, UK

How can I make sure that this new direction is a risk or investment worth making?

"Often people change roles and find the grass isn't always greener. It's a drastic step to take, and is one that can be hard to reverse".

Property Inspector, UK

SEEING THE FUTURE: LEARNING BY DOING IN 2023

RISHA – India, Age 28*

SITUATION
Textile worker in a factory for 5+ years. Struggling to self-skill ahead of automation.

FAMILY
Unmarried, with familial obligations and pressures.

MINDSET
Anxious. Unaware of transferrable skills.

ACTION
Expands factory-relevant technical skills via apprenticeship, after using VR to hone in on viable career options.

OUTCOME
Overcomes nerves. Transitions to new role through apprenticeship.

Choosing your own adventure

Returnships open new doors of opportunity for factory workers

India Business Daily – 21 September 2023

In a small office in Lucknow, 24-year-old Risha is wearing a VR headset. "Yes, I think we will have some flexibility on price," she says. "Would you like to see how other customers have used the product?"

Risha, who currently works as a sewing machine operator at a garment factory, is experiencing what it would be like to work in retail. VR software is enabling her to provide remote customer service while assessing how she responds. Ultimately, it will make a recommendation on whether the role is a good fit for her.

Until two weeks ago, Risha had never used a VR headset. "At first I felt very self-conscious. But it soon starts to feel natural, and you are able to focus entirely on the needs of the customer."

* Based on ethnographic interviews with ~60 workers across five countries

The session is being run by UPskill, a nonprofit joint venture of the Uttar Pradesh state government and local employers. "The economy is changing so quickly with all the technology coming in," says CEO Pranshul Kumar. "We need to make the best use of our people. With VR, it is possible to experience a wide range of careers you might never otherwise consider."

Aakash Pratap owns the garment factory where Risha works. "As a businessman, I have to keep up with changing possibilities," he says. "In the coming months, I am bringing in automated sewing machines, which unfortunately means I will not need Risha to do her current job.

"When UPskill approached me about a collaboration, I said yes. All my workers spend one hour of the day talking with an UPskill coach or shadowing workers in other roles within my operation. It is good for them, and if I find that they can do other work for me, it will also be good for me."

Risha has been shadowing colleagues who work in quality control, and Pratap is satisfied that she has the skills to step into the role. There is no current vacancy, but Pratap hopes automation will enable him to expand production and create new positions.

Risha has also taken an interest in retail customer service. An older female colleague, who had worked at the same factory before leaving to work at a store, encouraged her to consider it.

"I wasn't sure I could do it, but she said I should try. My parents are worried about me working late, especially if I have to close up a shop, as the commute would be long," Risha says.

While the VR software predicts that Risha has an aptitude for retail, she ultimately decides she would prefer to stay at the factory. She registers for a course in automated sewing machine repair and maintenance.

"My UPskill coach found that another factory in the area is already using automation technology. After I finish my course, Mr. Pratap has arranged for me to spend a week at their factory, observing and putting into practice what I have learned."

The repair and maintenance course will be mostly conducted in VR. "It looks like I will be getting very used to it," Risha says with a smile.

How Might This Work?

Imagine a world where exploring career options through on-the-job, hands-on learning is the new normal. Workers of all ages learn and earn through programs that give them firsthand insight into jobs and roles via real and virtual experiences, allowing them to put their skills into practice without interrupting income.

Workers would experience hands-on learning through inter- and intra-company rotations, shadowing opportunities and virtual programs, returning to their employer when they have completed their studies. Visiting workers would provide employers with a short-term infusion of new ideas and talent, while building credible work history, skillsets and a professional network. There are long-term benefits for employers too, including a more skilled, adaptable and loyal workforce.

To enable this, employers could:

- **Design job positions and projects to activate multiple types of skills**—from technical to digital to social—equipping workers with the expertise and growth mindset to pivot as needed;

- **Embrace non-linear paths** and non-conventional role choices; and

- **Gear worker incentives** and performance reviews towards rewarding breadth and adaptability, as well as specialization.

Workforce development organizations play a role as well, by building networks for rotational programs within and across industries and developing new ways for workers to explore career pathways using emerging technology.

Ultimately, this would expand talent pools, as employers recognize and hire talent based on performance and potential rather than pedigree.

"People will generally work incredibly hard if they see a clear path to better their situation, but systems have a profound impact on motivation. If you can't translate your skills into a better job, it's hard to stick with it as a working learner. A platform for inclusive hiring that allows employers to hire any candidate on the basis of their skills, no matter what their background, and accessible ways for people to experience how their skills may apply to a new job, would be game changers. Motivation must be met with opportunity— otherwise, it fades."

Byron Auguste
CEO and Co-Founder, Opportunity@Work

Pioneers Bringing the "Experience" Solution Space to Life

QUEST Alliance

QUEST Alliance has trained over 20,000 youths for jobs in India's retail, customer interaction and services sector, with a 70 percent placement rate. The organization blends in-person training with computer-based and mobile learning in Vocational Training Centers. QUEST is currently exploring the application of virtual reality tools for skill building and career development.[51]

AT&T

In 2013, US telecommunications giant **AT&T** projected that 40 percent of their jobs would not exist in 10 years, so they embarked on a company-wide reskilling effort, dubbed "Workforce 2020", to retain rather than hire talent as technology advanced. As part of this process, the company streamlined their organizational structure and created an online system, Career Intelligence, to help employees consider and navigate towards new internal career prospects. Today, more than half of its employees have completed a cumulative 2.7 million online courses in areas such as data science, cybersecurity, Agile project management and computer science. AT&T employees engaged in new skilling are twice as likely to be hired into a newer, mission-critical job within the company and four times more likely to make a career advancement.[52,53,54]

Opportunity@Work

The non-profit **Opportunity@Work** increases economic mobility for underrepresented segments of the workforce by expanding inclusive, skills-based hiring among employers and pioneering innovative financing solutions for low-income skill seekers. Their first financing solution places learners at the center rather than lenders, with underwriting based on an individual's readiness, rather than his or her credit history. Financial incentives for all stakeholders are based on long-term employment, and assistance goes beyond tuition to cover other financial responsibilities (e.g. cost of living, transportation, learning materials, etc.). The safety net this creates not only increases access to training, but also improves program completion rates and career outcomes.[55]

EMPOWER
Network and Grow

Sustaining workers' drive for lifelong learning by connecting them to skill-sharing, mentorship, networking and peer-to-peer support.

Understanding Today

Many mid-career workers doubt their ability to shift to new lines of work, often worrying about competition from younger, more specialized workers. These fears are not unfounded: research suggests that older applicants have lower callback rates, especially older women.[56]

Mentorship, networking and peer-to-peer support can help these workers—not only with gaining new skills, but also with emotional support, motivation and inspiration. A three-year study in Ontario, Canada found that individuals who maintained regular, long-term involvement in a peer support network were more likely to become employed and achieve a higher income, compared to those with shorter or less regular participation.[57] In fact, research from the Massachusetts Institute of Technology has shown that group incentives are more than twice as effective at altering behaviors as incentives provided to individuals.[58] This is a powerful dynamic to invoke for the purpose of helping workers build new skills.

Most workers struggle to fit skilling into their busy schedules. Individuals in less complex roles face the added challenge of limited financial means and lower job security. This not only makes it difficult to maintain a steady learning regimen but also means that professional development is more likely to be de-prioritized or derailed in the event of unexpected schedule changes, such as those related to childcare, transportation, accommodation and/or sick leave.[59]

Finally, few platforms effectively bridge the gap between virtual and in-person groups. Virtual communities find it harder to maintain engagement, and they may not provide as much visibility as in-person networks for ground-level and/or informal opportunities. In-person networks, however, have a more limited reach, and few programs exist at the neighborhood, city or regional level to help job seekers support each other through career transitions. These tend to be grassroots initiatives that rely on the drive, funding and/or availability of active individuals.[60]

Box 5: Worker Voices from Ethnographic Interviews, Accenture Research

Where can I turn to for support and inspiration on this journey?

"Just being able to know that someone else is going through the same thing, [that] you are not alone, makes it a whole lot more bearable and hopefully enables you to accomplish the goal of finding a new job".

Librarian, US

How can I compete with younger workers, who are often more tech-savvy and/or specialized?

"I would not pursue teaching now at my age. It would be too much competition [with younger candidates]".

Accounting Clerk, US

What do I do when 'life happens'?

"I really like the idea of mutually being able to share responsibilities and finding a physical support group rather than just online. I really think that would help people".

Retail Worker, US

ALICE – Ireland, Age 35*

SITUATION
Member of the gig economy.
Looking for a more stable job.

FAMILY
Single mother, one daughter.

MINDSET
Exhausted. Overworked and unable to plan strategically.

ACTION
Explores entrepreneurial idea thanks to support and networking from a blended community support group called the WorkShop.

OUTCOME
Launches start-up.
Gives back to the group.

SEEING THE FUTURE: COMMUNITIES OF SUPPORT IN 2023

Paying it forward and giving back

Henry: Tonight we're taking a break from our fortnightly skill-sharing workshops and instead having a Q&A with someone whose journey we can all take inspiration from. Everyone, please welcome back our very own Alice Walsh!

Alice: Thank you, Henry!

Henry: For those who don't know you yet, Alice, give us a quick intro.

Alice: Sure. I own and run Holle's Helpers, a property management company for short-term property rentals. I got my start right here at the WorkShop. I see Hans is here tonight. He showed me how to make a business plan to get a starter loan from the bank.

Henry: That's wonderful—it's why we're here, to help each other! Tell us more about your business.

* Based on ethnographic interviews with ~60 workers across five countries

Alice: We provide cleaning, laundry, repairs and maintenance—all that. Do you know how many people there are renting out flats and houses in Cork? It's amazing. I didn't have any idea until—well, about 18 months ago. It was the very first WorkShop I came to, in fact.

Henry: So what were you doing at the time, Alice?

Alice: Cleaning. Well, anything I could find, really. But mostly cleaning. I lost my job when the department store where I worked brought in those robot stockroom assistants.

Henry: And how did you find out about the WorkShop?

Alice: I was desperate for childcare one day. I had a last-minute cleaning job, and I needed the money, but my girl was off school sick, and I had nobody to sit with her because my mother was at work. In the end I called Caroline—who I can see has joined us via livestream today. Hi, Caroline! We used to work together and she'd lost her job too, and I thought maybe she'd be free and I could offer to return the favor. And she—well, Caroline, you tell them.

Caroline: I told her there's a group of us here that do exactly that. Help each other in a pinch, I mean. When I got your call, I was on my way to another member's house to thank him for helping look after my dad, who'd just had an operation.

Alice: So I came to the next meeting. I almost didn't, Caroline, do you remember? I asked where it would be and you said you'd have to double-check because it's a 'pop up community space'. I'd never heard that phrase before, I thought it sounded like a circus.

Henry: But you came, and you met all of us "sword-swallowers", and "trapeze artists", and "high-wire acts"…

Alice: It does feel like a high-wire act, doesn't it? Trying to get by, I mean. This place has been a safety net for me…

How Might This Work?

Imagine a world where workers make new connections and establish a strong support system comprising people at every stage of their careers who can provide mutual motivation, guidance and networking.

These communities are both physical and digital, facilitating both online discussion and face-to-face meetings, enabling networking outside existing social circles and increasing the value of members' social capital by augmenting peer-to-peer with 'peer-to-hero' interactions. They also provide a safe space in which to adopt new ways of learning.

These communities could:

- **Function as learning hubs:** communities of learning that help workers learn with and from each other, develop new ways to skill and unlearn old habits;

- **Encourage workers** who have experienced success to give back and pay it forward to the community;

- **Facilitate and incentivize** the sharing of knowledge and skills, both in-person and remotely;

- **Create social capital** by improving visibility into local opportunities and strengthening place-based ties through new, diverse networks;

- **Enable workers** to take a balanced approach to and share the burden of learning, career objectives, family and financial commitments.

By fostering community-building activities, workers in the process of making a career transition develop confidence, exchange knowledge and skills, build diverse support systems and access personalized advice.

> **"Right now, the workforce is in flux, and traditional workforce development isn't working. [This] report identifies the gaps in our existing system. A partnership approach that supports communities and workers as they update and automation-proof their skills is critical. Forward-looking employers can facilitate this by engaging with workforce development organizations and key community leaders to harness regional strengths and catalyze social innovation."**
>
> **Kristin Sharp**
> Executive Director, Shift: The Commission on Work, Workers, and Technology

Pioneers Bringing the "Empower" Solution Space to Life

SKILLSHARE

Skillshare

Skillshare is a US-based online learning community that connects individuals with expertise in dozens of creative and entrepreneurial disciplines with others who wish to learn from them. Today, the Skillshare community consists of over five million members, 6,000 of whom are teachers, delivering courses from 100+ countries around the world. In addition to taking classes, members can also use the site to receive feedback on projects, connect with others in their industry, and discover new career opportunities. Premium membership, which offers unlimited access to the full catalog of 20,000 classes, starts at just $8 per month.[61]

SHIFT

ShiftLabs

ShiftLabs is a community design lab run by New America, with initial support from the Rockefeller Foundation. ShiftLabs works in partnership with communities across the United States to diagnose automation risk in their region, surface potential responses to prepare for the future of work and design and experiment with new, innovative ways to help workers connect to opportunity. Launched in spring 2018, New America has run ShiftLabs in Phoenix, Indianapolis and Detroit, and will expand to new regions in 2018 and 2019.[62]

Good Things Foundation

Good Things Foundation

Good Things Foundation is a UK-based charity whose mission is to help people improve their lives through digital training. The charity reaches beneficiaries through a network of over 5,000 local community partners in the UK, the Online Centres Network, and is also expanding in Australia. Good Things Foundation provides partners with training and support, online learning content and the opportunity to participate in funded programs. They specialize in reaching those facing social exclusion and helping them build the essential digital skills for life and work. The Foundation recently partnered with Google to deliver the Digital Garage, working both in communities and through a digital skills bus making planned stops at Online Centres Network locations, to help workers develop digital skills to find a new job, set-up a new business or make their existing business more efficient and profitable.[63]
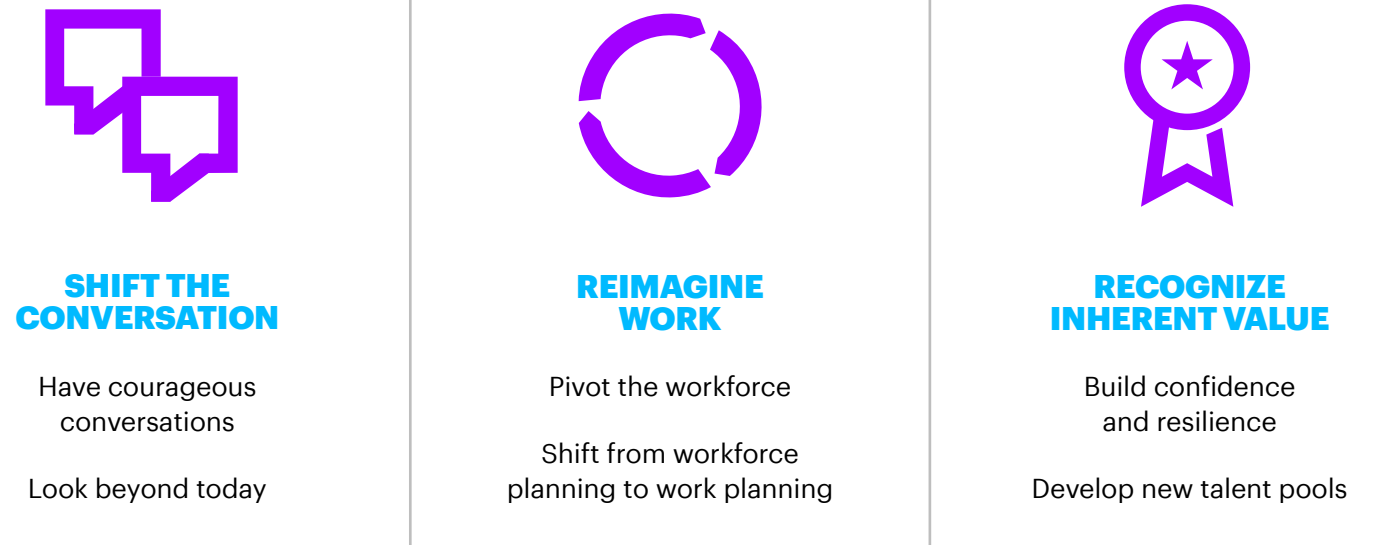
# JOIN US TO BUILD AN INCLUSIVE FUTURE OF WORK

The new skilling solutions outlined in this report are intended as tools for business and workforce development leaders to prepare the workforce for a changing world of work. However, to achieve impact at scale, actions must be taken across sectors, not in silos.

We believe that systems-level change is required by leaders across sectors to reframe the conversation on technology and work (see Figure 5).

Figure 5: Three Principles for an Inclusive Future of Work, Accenture

SHIFT THE CONVERSATION

Have courageous conversations

Look beyond today

REIMAGINE WORK

Pivot the workforce

Shift from workforce planning to work planning

RECOGNIZE INHERENT VALUE

Build confidence and resilience

Develop new talent pools

To begin putting these principles into practice, **Appendix V** offers a set of concrete actions that employers and workforce development can take today.
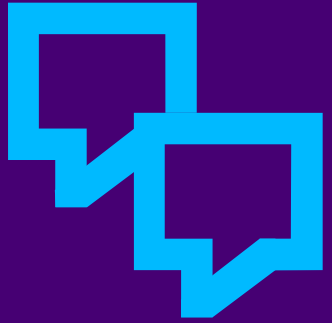
SHIFT THE CONVERSATION

- **Have courageous conversations.** Employers proactively plan for and communicate to workers about the impact of intelligent technologies on their jobs. They also provide their workforce with information about the transferable skills needed for success in the digital economy, as well as access to skilling resources. Across the new skilling ecosystem, stakeholders increase data and knowledge sharing to better anticipate talent and training needs.

- **Look beyond today.** Workforce development organizations engage with employers about the future of work, focusing on not just today's jobs but also on preparing workers for the roles of tomorrow. They support workers with new skilling by shining a light on the potential impact of intelligent technologies and by curating future-focused learning content that is suitable to workers of all backgrounds and career stages.

REIMAGINE WORK*

- **Pivot the workforce.** Employers prepare workers to collaborate with machines as new AI-enabled business models are created. Roles are redesigned to support continuous learning and equip the workforce with the skills for today and tomorrow. Employers' and employees' expectations shift to allow for co-investment of time, funding and efforts to help workers learn, progress and transition.

- **Shift from workforce planning to work planning.** Employers restructure how tasks are allocated across their business, carving out work for agile teams composed partly or wholly of mid-career apprentices, interns, contractors, etc. Workers have more autonomy and decision-making power to enable this change and adapt to new ways of working.

* For more detail on Accenture's vision for the future workforce, see **Reworking the Revolution**.

RECOGNIZE INHERENT VALUE

- **Build confidence and resilience.** Workforce development organizations build workers' confidence in the value of their skills and their ability to learn new ones. They encourage workers to share their strengths with others and promote peer-to-peer interactions, foster network-building through group incentives, and combine mentorship and coaching with skilling programs.

- **Develop new talent pools.** Employers prioritize potential over pedigree and embrace new skilling. They are open to nontraditional candidates and recognize the value of building teams with diverse work histories. They recognize that new skilling helps retain institutional knowledge and attract top talent.

We are actively engaging an ecosystem of partners to design, develop and pilot solutions to address the issues raised in this report—starting with a first wave of projects underway in the US and UK.

These pilots will serve as laboratories to test and improve our new skilling framework with the aim of helping workers in less complex roles navigate the transition ahead.

Join us to build an inclusive future of work. Let us know if you would like to help mobilize pilot projects, scale what works, or serve as an advisor.

Contact us at **corporatecitizenship@accenture.com**

APPENDICES

Appendix I. Acknowledgements

We would like to thank the following business leaders, experts, practitioners and new skilling pioneers for their valuable insights and contributions to shaping this research.

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Appendix II.
Methodology

Our Approach: Blending data, design and delivery

Since most research to date has focused on the scale of impact by intelligent technologies, we blended data, design and delivery to ensure a worker-centric, action-oriented approach.

Accenture Corporate Citizenship's partnership with The Dock, a design-led, multidisciplinary research and incubation hub based in Ireland, was crucial. The Dock's research and design process was instrumental in developing human-centered research, bringing forward worker voices and expert perspectives from inside and outside the company. The Dock supported by:

- Conducting ~30 **expert interviews**, including senior staff and thought leaders from NGOs and experts in skills training to understand the context for technology-driven change;

- Leading a series of ~20 **in-person ethnographic interviews** with workers in occupations that consist of routine activities and only require primary or secondary education in India, UK, US and Ireland to understand the problem through a local lens and challenge individual biases; and

- Running a series of three virtual rumbles bringing together experts from across Accenture.

Accenture Corporate Citizenship also partnered with Accenture Research to complement this qualitative, human-centric approach by:

- Analyzing data from Accenture's **Future Workforce surveys** of 14,000+ workers and 1,200+ business leaders to understand their views on intelligent technologies and the workforce;

- Using **economic modelling** to determine the proportion of time workers spend on automatable and augmentable activities across seven countries, with a detailed look at susceptibility of automation by role cluster and complexity; and

- Conducting a series of ~40 **online ethnographic interviews**.

Finally, we also completed a **new skilling ecosystem scan** of ~200 organizations to understand the gaps in support and identify pioneers across business, nonprofit and government players that are leading the way in shaping new skilling solutions for workers.

Additional detail on each of these activities is on the following page.

Expert Interviews

Accenture interviewed ~30 new skilling and future of work experts across six countries. These experts contributed subject matter expertise on three categories:

NEW SKILLING EXPERTS	
Employer-led	13 interviews
Government-led	4 interviews
NGO/academia-led	9 interviews

Ethnographic Interviews

To understand the qualitative experience of job displacement and test the four new skilling solution spaces, Accenture conducted in-person and online ethnographic interviews with ~60 workers across five countries. We screened for participants who:

- Hold educational credentials that are less than a Bachelors' degree
- Earn low to medium income
- Are currently in the workforce, either employed or looking for work
- Are currently experiencing or face imminent risk of job reconfiguration

We conducted 21 interviews in person and 38 interviews online.

GEOGRAPHIC REPRESENTATION	
India	10 interviews
Ireland	2 interviews
United Kingdom	21 interviews
Canada	1 interview
United States	25 interviews

Future Workforce Surveys

Accenture conducted surveys of 14,000+ workers and 1,200+ business leaders to understand their views on intelligent technologies and the workforce.

Countries

- Australia
- Brazil
- China
- France
- Germany
- India
- Italy
- Japan
- Spain
- UK
- US

Industries

- Automotive
- Banking
- CG&S
- Energy
- Health & Life Sciences
- Infrastructure & Transportation
- Insurance
- Media & Entertainment
- Retail
- Software & Platforms
- Telecom
- Utilities

Economic Modelling

Accenture Research modelled the proportion of worker time spent on automatable and augmentable activities across seven countries, with a detailed look at susceptibility of automation by role cluster and role complexity. This analysis on employment data from National Statistical Offices, ILO and O*Net Database was published in Accenture's **It's Learning. Just Not As We Know It.** report.

- Brazil
- France
- Germany
- Japan
- South Africa
- UK
- US

Accenture Research model consists of two key steps:

1. Defining and deriving role clusters

The objective of this modelling exercise is to create empirically-derived groupings of roles and occupations that utilize similar skills and perform similar tasks in their work. Workers within each cluster can be expected to be affected in similar ways as intelligent technologies take hold in the workplace.

The main steps of analysis were as follows:

- Statistical clustering techniques (principal component factor analysis) were employed to analyze the skills, abilities and work activities in O*NET's database (derived from 974 representative occupations in the US). This activity generated six distinct factors for skills and abilities, and five distinct factors for work activities.

- The importance of each of these factors was used to tag occupations into six groups for skills/abilities and five groups for work activities.

- The groups were cross-referenced against one another to identify the combinations (clusters) that grouped at least 35 percent of workers within a skill/ability group. The result was 10 such groups, which represent our 10 role clusters.

- The 10 role clusters were used to categorize the workforce composition of seven countries. This was done through the creation of conversion tables that matched each national occupation code to US occupation codes. US employment figures were sourced from the **Bureau of Labor Statistics**. Employment at the occupation/industry level for each other country was sourced from national household surveys and other national statistical sources.

- Under the assumption that the same occupation utilizes similar skills and performs similar tasks across countries, the categorization of occupations within the US Role Clusters were then applied to the other countries.

2. Assessing the impact of technology on tasks

The impact of technology on tasks for different occupations was assessed through the following steps:

• Data from the Occupational Information Network (O*NET) of the US Department of Labor and from the International Labour Organization (ILO), were used to calculate the total time worked by workers in each country and each industry, based on the task frequency of 330+ work activities for 900+ occupations derived from O*NET.

• Technology experts tagged each of these tasks according to how intelligent technologies would impact the task through augmentation and automation.

• The total potential time susceptible to automation and augmentation was computed for different occupations and aggregated at the cluster level, based on the frequency with which they perform the work tasks.

New Skilling Ecosystem Scans

Accenture conducted a scan of ~200 organizations assessed across 22 countries:

• 60 nonprofits

• 39 tech ecosystem and corporates

• 28 start-ups and social enterprises

• 22 funders and accelerators

• 17 governments and multilaterals

• 17 universities, think tanks and networks

Through this ecosystem scan, we have identified a selection of pioneers across business, nonprofit and government players that are leading the way in shaping new skilling solutions. These are outlined in **Actionable Solution Spaces for an Inclusive Future of Work.**

Appendix III.
Role Clusters and Role Complexity Definitions & Distribution of Employment by Role Type, by Country and Role Complexity

Box 6: Role Clusters

ROLE CLUSTER	TYPICAL ACTIVITIES	ILLUSTRATIVE OCCUPATIONS
1. Management and Leadership	Supervises and takes decisions	Corporate managers and education administrators
2. Empathy and Support	Provides expert support and guidance	Psychiatrists and nurses
3. Science and Engineering	Conducts deep, technical analyses	Chemical engineers and computer programmers
4. Process and Analysis	Processes and analyses information	Auditors and clerks
5. Analytical Subject-Matter Expertise	Examines and applies experience of complex systems	Air traffic controllers and forensic science technicians
6. Relational Subject-Matter Expertise	Applies expertise in environments that demand human interaction	Medical team workers and interpreters
7. Technical Equipment Maintenance	Installs and maintains equipment and machinery	Mechanics and maintenance workers
8. Machine Operation and Maneuvering	Operates machinery and drives vehicles	Truck drivers and crane operators
9. Physical Manual Labor	Performs strenuous physical tasks in specific environments	Construction and landscaping workers
10. Physical Services	Performs services that demand physical activity	Hairdressers and cooks

Appendix III.
Role Clusters and Role Complexity Definitions & Distribution of Employment by Role Type, by Country and Role Complexity

Box 7: Role Complexity[64]

How do we differentiate between more and less complex roles?

Role complexity has been defined in accordance with the International Labor Organization's (ILO) International Standard Classification Occupations (ISCO), which groups occupations across ten major groups. Our analysis excludes military occupations, including nine of ten major groups.

For the purposes of this analysis, 'more complex' occupations are classified as ISCO groups 1 through 3 (Managers, senior officials and legislators, Professionals, and Technicians and associate professionals), which map to ILO's skill level of 3 and 4.

'Less complex' occupations are defined as ISCO groups 4 through 9 (Clerks, Service and Sales workers, Skilled agricultural and fishery workers, Craft and related trades workers, Plant and machine operators and assemblers, and Elementary occupations), which map to ILO's skill level 1 and 2.

The ILO defines skill level as a function of the complexity and range of tasks and duties to be performed in an occupation based on: task complexity, formal education typically required, and informal on-the-job training and/or previous experience in a related occupation required. Roles in skill level 1 and 2 typically require primary or secondary education, while roles in skill level 3 and 4 require more advanced education.

Figure 6: Distribution of Employment by Role Cluster, by Country and Role Complexity (%). **It's Learning. Just Not As We Know It.** Accenture, 2018. Analysis on Employment data from National Statistical Offices, ILO and O*Net Database

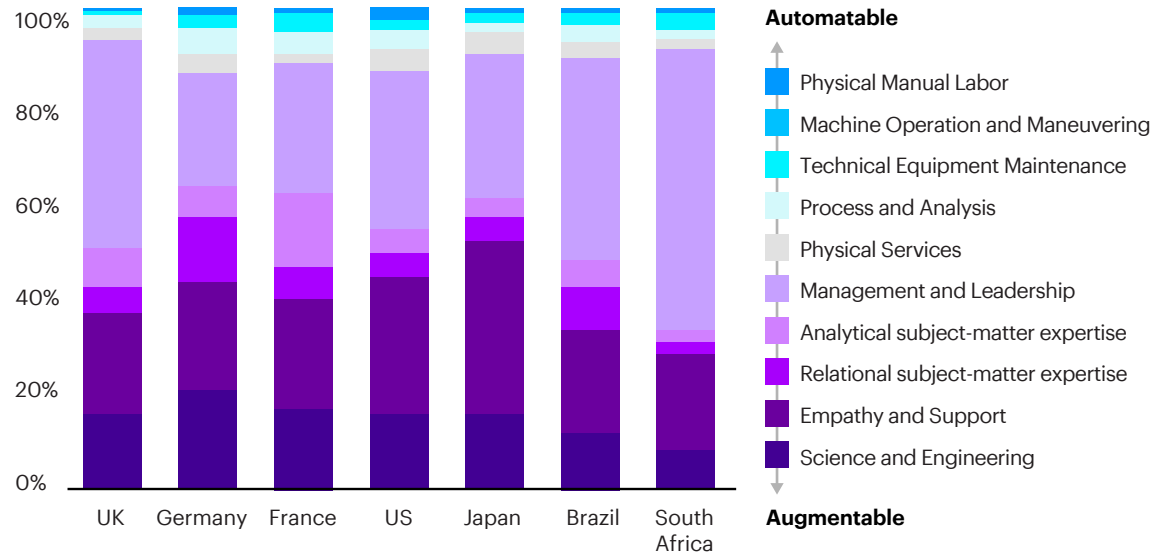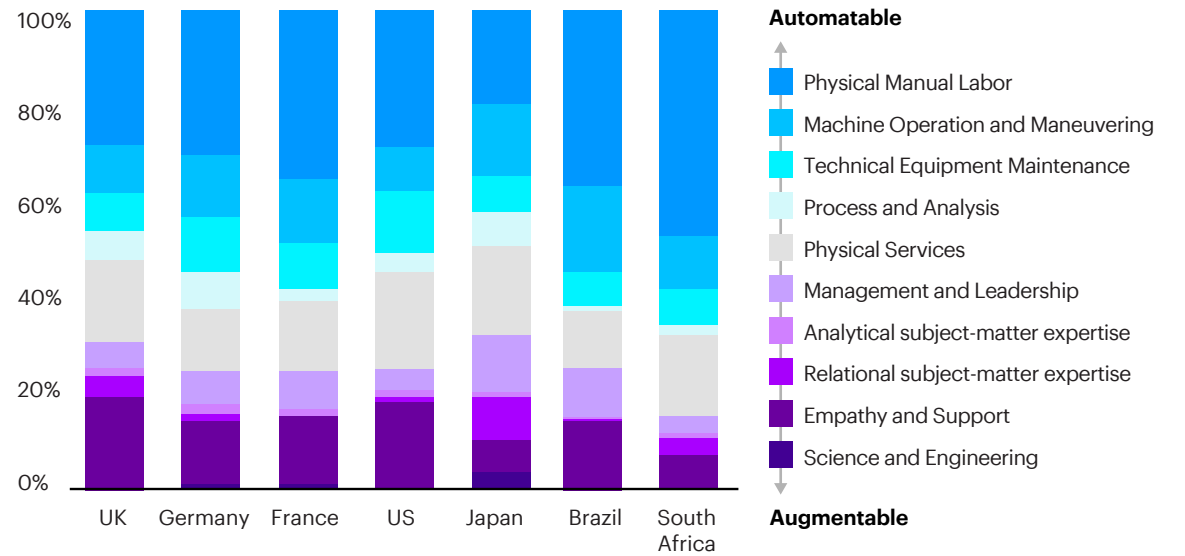**Figure 7:** Distribution of Employment by Role Cluster, by Country and Role Complexity (%). **It's Learning. Just Not As We Know It.** Accenture, 2018. Analysis on Employment data from National Statistical Offices, ILO and O*Net Database

DISTRIBUTION OF EMPLOYEE BY ROLE CLUSTER, HIGHER COMPLEX ROLES

DISTRIBUTION OF EMPLOYEE BY ROLE CLUSTER, LOWER COMPLEX ROLES

Appendix IV.
Investing in New
Skilling Benefits All

Creating an inclusive future of work will require workers, employers and workforce development organizations to collaborate towards the common goal of a stronger new skilling ecosystem. By benefiting both workers and employers, workforce development organizations will fulfill their mission of improved employment outcomes.[65]

WORKERS	EMPLOYERS	WORKFORCE DEVELOPMENT ORGANIZATIONS
Tailored skillsets. Workers' skillsets will meet the local market demand, improving long-term outcomes. Programs that offer occupational skills training that leads to industry-recognized certifications tend to generate better outcomes across placement rates, earnings and retention.[66]	**Deep talent pool.** By filling new roles with existing employees, employers retain institutional knowledge, limit downtime and disruption, and reduce the costs of hiring. In contrast, the cost of turnover for an employee is 21 percent of their annual salary,[71] not including productivity losses.	**Strengthened employer relationships.** As the scale of training and learning programs grows, workforce development organizations will gain deeper insight into skilling needs, increasing relevance to employers.
Access to opportunities. By developing new skills while still employed, rather than after displacement, workers will find new employment more easily. In the US, employed applicants generate twice as many interviews and three times as many offers as their unemployed peers.[67]	**Reputational benefits.** Forty-five percent of employers and 36 percent of workers consider supporting new skilling to be the employer's responsibility.[72] Supporting new skilling internally and expanding hiring practices to include nontraditional candidates from the local workforce strengthens community relationships and positions employers as responsible and inclusive.	**Increased probability of long-term impact for beneficiaries.** Participants in sector-based workforce programs—where workforce organizations work with employers that are in a single industry sector or that hire for a cluster of occupations—have significantly higher earnings and are more likely to be employed in the second year and to remain employed more consistently and for longer periods of time.[73]
Strengthened job fit. Helping workers understand how intelligent technologies and automation will impact roles—and their available career options—will improve job fit, which is linked to higher performance and lower stress.[68,69,70]	**Increased efficiency.** Smaller employers can benefit by partnering with other employers and workforce development organizations to improve efficiency and reduce the cost of training and learning programs.	

Appendix V.
Six Actions To Take Today

Employers

- Set up safe venues for honest conversations, empowering workers to discuss work preferences without fear of penalization and HR to offer timely advice about organizational changes

- Adapt and finetune existing learning resources with input from workers in less complex roles

- Invest in agile workforce capabilities and strengthen onboarding and handover processes

- Develop meaningful short and longer-term opportunities for hands-on learning

- Update hiring practices to extend to non-traditional talent and spot individuals' potential

- Invest in fostering learning communities and networks within and outside the workplace, either by establishing internal communities or partnering with third parties

Workforce Development Organizations

- Engage with companies to encourage data sharing and push the need for visibility into changing roles

- Devise a targeted approach to proactively identify and engage workers before their jobs fall at risk of significant reconfiguration

- Understand the skill families that will be locally in-demand in future and tune learning provision accordingly

- Leverage virtual career sampling to minimize time away from the job and give workers experience at scale

- Identify opportunities to leverage existing platforms, such as Next Door or MeetUp, to create digitally-enabled communities

- Devise group incentives that can help improve the adoption and retention of skill and career-building behaviors

Appendix VI.
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