How adaptive skills can play a pivotal role in building the manufacturing sector of the future

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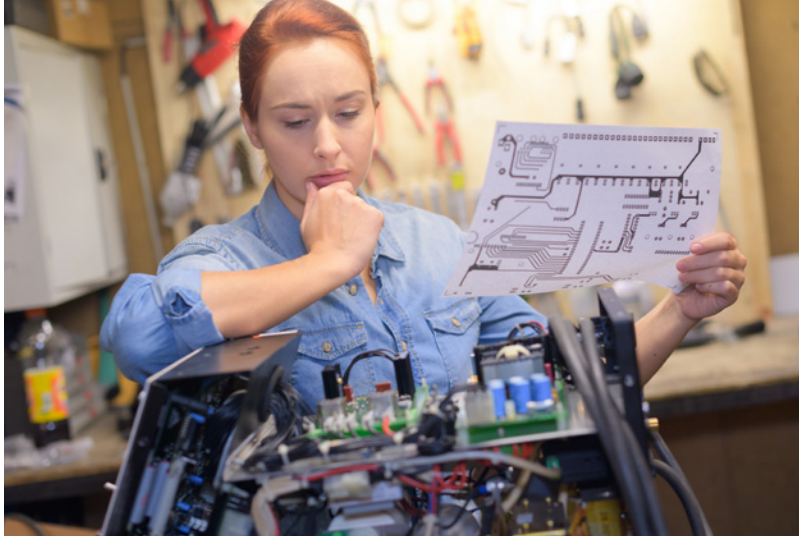

It's no news to say there's a skills gap in manufacturing. Industry leaders have spearheaded change and initiatives to find and train new workers for over a decade.

And while there has been significant progress, the last few years – thanks in large part to the COVID-19 pandemic, supply chain bottlenecks and demographic changes – have reshaped the entire labor force and accelerated challenges for every employer from large to small. The list of impacts is long: changes in what employees want from work and their careers, advancing technologies radically altering traditional roles, and a fiercely competitive, tight labor market with competition for top talent across industries. From shop floor to sales and manufacturing to back-office teams, the story is the same. Good people with the right skill sets are hard to find and are hard to keep. And more must be done as an industry if we are to build the manufacturing base the future already demands.

Perhaps, we need to take a fresh perspective on the skills gap and lack of talent. Maybe, one of the answers to addressing this shortage lies less in finding the exact experience and manufacturing skills to fill specific roles but more in adapting a flexible view of potential talent. Individuals who aren't square pegs for square holes but bring transferrable skills from other industries, academic institutions and backgrounds as well as the aptitude to evolve and grow with their jobs. Doing this will help manufacturers begin the journey of transitioning their workplaces to ones that value forward-thinking, engaging and digitally-enabled work and that attract and retain this crucial talent. Let's take a closer look.

Accelerating pace of change is creating a burning need for talent to keep up

One thing is certain: As manufacturing continues to evolve, so must its talent. By 2030, an estimated 2.1 million manufacturing jobs could go unfilled if the skills gap is not adequately addressed.[1] Manufacturers face a critical opportunity to close the skills gap, and they need to do so quickly.

Ernst & Young LLP (EY) and The Manufacturing Institute spoke with United States ("US") manufacturing leaders to learn first-hand what key issues are top of mind across the industry. Leaders told us that the pace of change is increasing, requiring organizations to be more agile and make decisions faster. They also shared that Manufacturing 4.0 continues to play a major role where data-driven manufacturing is required for visibility and effectiveness. Automation is impacting the way in which people must work with machines, data, technology and each other as part of their core job requirements. Additionally, leaders referred to the talent scarcity directly impacting their business, where they feel the need to better attract, retain and develop talent across their businesses, particularly on the ground where the work happens.

In response to these developments, leaders consistently told us that they need a workforce with the agility to develop new capabilities as their organizations change and with the ability to respond to data-driven decisions and redefined roles. Leaders also made an important connection that to successfully attract and retain today's workforce, there must be a win-win value proposition. Specifically, it is crucial for employers to invest in reskilling in the areas that benefit both the employees and employers while doing so through impactful experiences. Successfully creating this win-win value proposition will engage employees while accelerating learning to maximize business and employee outcomes.

> Adaptive skills enable individuals to transform their abilities as their demands and environment change. Adaptive skills unlock a competitive advantage through accelerating transformation and directly addressing the skills gap in manufacturing.

While there were a number of ideas about how to achieve this, employers unanimously felt that a unique win-win opportunity to accelerate business and employee impact was through adaptive skills. Manufacturers know that they cannot remain competitive and future-ready as the industry rapidly evolves without a workforce with adaptive skills.

What are adaptive skills? Simply put, they are skills or traits that enable individuals to transform their abilities as their demands and environment change. Adaptive skills are highly relevant to the success or failure of an organization's efforts to transform, according to recent research by EY and Oxford Saïd Business School. Employees need to continually evolve and adapt their skill sets over time to adjust to new technologies and processes and to stay current in their profession. Such efforts benefit both the individual and their professional development but also the company, which reaps the rewards of increased productivity and enhanced employee morale.

> Organizations that put humans at the center of their business strategy by investing in the adaptive skills of their workforce are more than twice as likely to succeed in organizational transformation.

This research went on to demonstrate that companies that put humans at the center of their transformations are 2½ times more likely to successfully deliver on their transformation objectives. The study cites human factors as a critical root cause of transformation success and failure. According to the study, transformations that invest in adaptive skills are more than twice as likely to succeed than those that do not invest in adaptive skills.

What manufacturers told us

Industry leaders recognize that asking more from their existing workforces isn't enough. Almost 60% of manufacturers surveyed by the National Association of Manufacturers (NAM) are creating or expanding internal training programs to address skills shortages.[2] Yet, many might be unaware of adaptive skills' essential role. A new study by EY and The Manufacturing Institute shows that adaptive skills are highly relevant to manufacturing and that they directly address the industry's skills gap.

In 2022, building upon the research by EY and Oxford Saïd Business School, EY and The Manufacturing Institute researchers collaborated to uncover how manufacturing industry leaders can identify, develop and operationalize adaptive skills to meet the current and future demands of the industry.

We grounded our research on three key questions:

1. Are adaptive skills relevant in manufacturing, particularly at the shop floor level, and how can they best be enabled?
2. How can adaptive skills be a currency that manufacturers can use to expand talent pools and manage attrition?
3. How can organizations successfully arrive at developing adaptive skills?

Three pillars of developing adaptive skills:

1. Adaptive culture
2. Talent strategy that prioritizes adaptive skills
3. Individualized learning

We analyzed thousands of data sets and conducted in-depth interviews with workers and leaders to paint what we believe is the first complete picture of the critical importance of adaptive skills in a rapidly evolving manufacturing sector.

Through those interviews, we found that leaders agreed or strongly agreed that:

The skills needed for manufacturing jobs are changing rapidly	The skills needed for changing manufacturing jobs are outpacing the current workforce	Their organizations struggle to fill job vacancies because of quickly changing needed skills for the industry	Their organizations are seeking new and innovative ways to invest in the careers of their workforces
74%	65%	65%	82%

> Almost 60% of manufacturers surveyed by the National Association of Manufacturers (NAM) are creating or expanding internal training programs to address skills shortages.

The 8 critical adaptive skills

5 main skills + 3 manufacturing skills

EY and Oxford Saïd Business School's research uncovered five foundational adaptive skills that drive successful transformation across industries: learning agility, analytical acumen, social and emotional intelligence, resilience, and creative reasoning. Through interviews with leaders across manufacturing, EY and MI researchers heard how these adaptive skills have accelerated success for individuals, teams and organizations in the industry. Through these interviews, leaders also consistently mentioned three additional adaptive skills that provide value in manufacturing: root cause, accountability and systems thinking.

Based on the analysis of data sets from thousands of US manufacturing workers and in-depth interviews with both leaders and shop floor workers, we've identified the most important skills to develop among your workforce to aid your future transformation:

Analytical acumen

The ability to understand the current effort and apply data-driven and lean decision-making thinking to improve efficiency and solve problems.

What leaders are saying... "Individuals with analytical acumen can effectively navigate a volume of information and efficiently move to a solution."

Craig Haydamack, SVP
Chief Human Resources Officer, Milliken & Company

Business acumen

Having a firm understanding of business goals and operations is critical to examining processes and suggesting improvements.

What leaders are saying... "We want employees to feel empowered to speak up. If someone sees a problem, we want them to look for a way to fix it."

Heather Gilbertson
Director, Human Resources, Emerson

Creative reasoning

Solving problems with creative solutions.

What leaders are saying... "We have a group that meets across plants to discuss and share, this ... empowers them to develop creative solutions to the challenges they are facing, a culture of asking questions and problem-solving for the betterment of the whole organization."

Thad Gregory
Human Resources Director, Milliken & Company

Learning agility

The ability to understand and learn more effectively. This includes understanding preferred approaches to learning and using this knowledge to maximize learning time.

What leaders are saying... "If you are able to work in a team and have learning agility, we tend to be able to skill up for the rest of the requirements in the manufacturing workplace."

Micki Vanderpool
Human Resources Director, Owens Corning

Resilience

The ability to recover quickly from ambiguity or setbacks.

What leaders are saying... "Those who are adaptable and resilient are the ones you grow the most and the fastest in the industry."

Gwen Wilker
Vice President, Talent Acquisition, Emerson Electric Company

Additional adaptive skills relevant to manufacturing

Root cause analysis

Able to identify underlying conditions that are creating issues with a machine or system.

What leaders are saying... "It is important that people have a natural curiosity and use a 'why why' analysis to get to the root cause. You don't have to have all the answers, but unpacking an issue is critical in these roles."

Brent Duersch
Managing Director, Nottingham Spirk

Social and emotional intelligence

Social intelligence is the ability to effectively manage interpersonal relationships, while emotional Intelligence is the ability to understand context and take that context into account to effectively connect with others for positive outcomes.

What leaders are saying... "It is important for employees to be interested in other people ... It's critical for successful teaming."

Marc Brooks
Talent Acquisition Manager, Nucor Corporation

Systems thinking

The ability to break complexity down into relationships between parts – isolating for challenges and opportunities.

What leaders are saying... "It's being able to say, 'Even though I don't understand this, I can use logical thinking to think of the next step to solving it."

Brent Duersch
Managing Director, Nottingham Spirk

Focusing on the development of specific adaptive skills within the manufacturing workforce is a critical element in creating a future-ready organization. Prioritizing these skills can drive a cultural shift that expands the horizons of your workforce, widens your pool of talent and potentially boosts long-term organizational performance.

As part of our research, we asked three questions:

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Our interviews and research revealed that the three keys to developing adaptive skills in your organization are culture, talent strategy and learning. The following deep dives and examples illustrate the impact that adaptive skills can have on the business.

Three pillars of developing adaptive skills:

1. Adaptive culture
2. Talent strategy that prioritizes adaptive skills
3. Individualized learning

1

An adaptive culture accelerates the transformative benefit of adaptive skills.

We asked leaders about the importance of adaptive skills and learned that they are especially relevant to the future of manufacturing: In fact, 100% of interview participants agreed there is value and applicability in adaptive skills in the manufacturing industry.

Respondents shared a variety of examples where adaptive skills are pivotal to success across a wide range of manufacturing environments. "The skills needed for manufacturing are rapidly changing, but some still stay the same," said Micki Vanderpool of Owens Corning. "If you are able to work in a team, and have learning agility, we tend to be able to skill up for the rest of the requirements in the manufacturing workplace." Similarly, a person's ability to communicate with teammates suggests the presence of another key skill, social and emotional intelligence, which is crucial because it enables employees to learn from one another."

While there was an abundance of evidence as to the importance of adaptive skills, the topic we heard about most often was the need for an adaptive culture.

Adaptive corporate cultures — those that reinforce critical adaptive skill sets — intentionally engage the worker as an individual, a team member and an important part of the greater system. They also encourage employee-led problem solving that enables every team member to take ownership over their work and the overall results. In fact, a common theme we heard from organizations is that they struggle with many new entrants to their organizations to move beyond theoretical practice to the actual application within their job and the greater system.

Such organizations with adaptive cultures consider asking questions and problem-solving to be a critical part of improving the entire enterprise. As Mark Rayfield of Saint-Gobain shared, "It is about creating an environment for trying again. Creating a safe space for trial and error. That middle management on the shop floor is where the culture is set. You have to train people by setting the example. The culture is that managers are there to support the teams, not the other way around. Execs are here to support 'you' because this is where we all succeed."

In an adaptive culture, the tone is set from the top, but achieving your desired culture is ultimately dictated by employees who are influencers. They're usually go-to employees whose opinions are trusted and sought after. In manufacturing, the influencers are on the shop floor. The behaviors, opinions and ways of working exemplified by these influencers will either be the anchor that drags your organization down or the rocket ship that accelerates your organization to new heights. Leading organizations proactively identify these influencers and their networks, assess the tone and behaviors exhibited, and develop measurable actions to promote desired behaviors with this important population.

We also heard from manufacturers that another critical input to an adaptive culture is collaboration and feedback. Meaning engaging teams across your organization for input, rewarding good ideas and providing feedback about ideas submitted. Employees respect that not every idea will be adopted but only do so if they know that they have been heard. As Heather Gilbertson of Emerson Electric explained, "We want employees to feel empowered to speak up. If someone sees a problem, we want them to look for a way to fix it."

Ultimately, reinforcing adaptive skills through an adaptive culture serves to create a flywheel effect to generate exponential impact (i.e., reinforcing a continuous focus on and development of adaptive skills).

2

Adaptive skills are the translation point needed to reskill the current workforce and rebrand, attract and retain new talent pools.

Manufacturing is facing unique challenges amid the labor crisis, with greater cross-industry competition for skills of the future. We heard leaders cite limited pools of talent with both manufacturing and digital acumen, increasing competition among larger manufacturers and across industries, and challenges to increase agility and speed in hiring. And the problem goes beyond a talent shortage. Data-driven manufacturing requires new skill sets,[3] which further narrows the talent pool.

These challenges, among others, have left manufacturers understaffed and unable to fill empty roles. At the end of July 2022, 834,000 US manufacturing jobs were unfilled.[4] To fill these roles and create a resilient future-focused workforce that will continue to drive value, manufacturers need to invest in a workforce with adaptive skills. These employees must be able to continually reskill as their environment changes, creating a workforce that is ingrained and proud to be a part of their organization.

In order to overcome the challenges of today's environment, manufacturers must create a win-win for both employees and the business. Adaptive skills represent that win-win serving as a translation point to **reskill** through expanded talent pools, **attract** top external talent, **retain** top internal talent for employers while opening up new career paths and creating impactful experiences for employees to **rebrand**.

Reskill:
Unique synergies develop when workers have adaptive skills combined with traditional core skills. Adaptive skills serve as the translation point for those with traditional skill sets to access new opportunities and for those with more future-focused skills to connect with onsite job requirements. As a result, employees with traditional core skills can better connect to future needs allowing manufacturers to reskill workers across the business. Conversely, employees with adaptive skills can, in many cases, adapt to traditional roles.

"The skills needed for manufacturing are rapidly changing, but some still stay the same," said Micki Vanderpool, HR Director at Owens Corning. "If you are able to work in a team and have learning agility, we tend to be able to skill up for the rest of the requirements in the manufacturing workplace."

Attract:
Recruiting for adaptive skills helps to activate new recruiting sources. Legacy hiring practices are often centered on matching specific skills needed on the shop floor with candidates with expertise in those precise skills. Conversely, future-minded hiring practices target dynamic individuals with the ability to continually learn and upskill as the demands of the role shift. One of the organizations we studied has removed educational requirements to expand the talent pool.

To fill new and existing roles, organizations must expand their talent pools beyond traditional sources. Internally, using adaptive skills, many organizations have deployed existing talent into new roles, breaking the conventional linear career pathways. Breaking up conventional career paths creates an internal pipeline of talent who are already immersed in the organization reducing risks tied to culture fit and job fit associated with external hires. During our research, we heard a specific example of someone who had shown success in a desk role (accountant) and whose core adaptive skill set allowed her to move into a management role on the shop floor, where she quickly learned and ultimately became successful.

Others have reevaluated external talent sources and found this adaptive skill set in nontraditional manufacturing settings – seeking candidates without direct manufacturing-related education or experience. Those we interviewed found success in integrating with the local community college to develop and acquire talent.

> If you are going to be the best in the industry, you have to draw from a wide talent pool to find those that fit in your organization's culture of learning and adaptability.

Barry Crawford,
Vice President of Operations at FMC Corporation

Rebrand:
Job seekers today aren't necessarily seeking a career at one organization. Job seekers are looking for engaging, marketable and rewarding experiences. Americans are showing that they are willing to make big career changes for benefits like long-term work security. In 2021, about half of workers who changed jobs also changed occupations or industries.[5] In other words, as manufacturers are redefining what it means to work in manufacturing, talent is rethinking where and how they look for career opportunities. During our study, we found numerous examples where adaptive skills serve as differentiators to employees as they decide where to progress in their careers.

Through speaking with manufacturers, we confirmed more of how "new" manufacturing is redefining what it means to work in the industry. The opportunities available from the shop floor to the executive suite require a deep level of thinking and problem-solving, an understanding of systems and how to optimize their performance. Opportunities like these attract energetic, innovative talent, allowing manufacturers to compete with other industries for these exciting positions.

Younger workers, especially, are willing to change jobs for the sake of more fulfilling experiences. A separate study, by The Manufacturing Institute and Deloitte, said that while Gen Z's cohort, 18- to 24-year-olds, is less excited about the prospect of a career in manufacturing, a focus on technical skills – for example, the opportunity to work in a smart factory – is likely to make the industry appealing to them.[6] Adaptive skills serve as a foundational skillset to open the door to meaningful opportunities for this cohort.

Retain:
Manufacturers are finding that providing employees with opportunities to develop adaptive skills serves as sound retention mechanism. We heard many specific examples about people within the organization who showed high levels of accountability and agility and were able to grow their skillset from manual to digital or manual to leadership and therefore remained engaged and more likely to stay in manufacturing as their career opportunities expanded.

The manufacturing workforce is seeking opportunities to invest in the longevity of their manufacturing career and struggling to access them. This opens the door for employers to provide customized learning as a differentiator for current and future employees. According to the American Upskilling Study,[7] more than half of production employees want to participate in an upskilling program (52%). Yet less than 40% of these employees have access to any employer-supported upskilling opportunities.

Leaders are broadening their efforts to market the value of adaptive skill sets to create a more fulfilling career while also opening up new career pathways. These efforts help to differentiate the employee value proposition (EVP) or value to the employee of working at a given employer and directly address attrition risks.

3

Learning structured around highly immersive experiences that incorporate adaptive skills into business execution accelerates behavior change.

According to the EY Work Reimagined study, 60% of manufacturers (AM&M sectors) said investing and upskilling/reskilling your workforce for evolving work and technology requirements is "critical to a sustainable future of work." While investment is important, making the right investments is paramount. This equates to investing in the right skills and creating the right learning experiences. In our analysis, we learned that employers are using adaptive skills as a catalyst and a rationale to challenge current learning strategies. We have found that combining immersive and individualized learning experiences accelerates the win-win between the organization's business needs while fulfilling workers' desire for a more meaningful work experience.

Immersive learning

Immersive experiences provide contextually accurate and appropriate learning in which the learner evaluates real-life variables to determine the best course of action and can experience the results without consequence so that they are able to more fluidly transfer that learning to the job, even for abstract subjects such as adaptive skills.

Companies that rely on traditional one-size-fits-all learning models are not optimizing their investment in adaptive skills. Immersive learning experiences use real-world scenarios to train employees in an engaging environment. Leaders shared how they effectively incorporated immersive learning experiences on the shop floor to teach adaptive skills across their workforce. Additionally, leaders shared the iterative value of adaptive skills, that once workers have achieved a baseline proficiency in an adaptive skill set, they are more effective and efficient at learning the traditional skills needed on the shop floor. For example, we heard how an investment in teaming built social and emotional intelligence, allowing workers to learn from each other to understand machines across the shop floor. This allowed for a wider understanding of the overall plant across the plant workforce.

One leader, for example, recalled using augmented reality to train employees on new technologies on the shop floor. The augmented reality overlayed lessons about the new system over the existing shop floor in real time. Tenured employees enjoyed the ease and comfort of learning in the environment that they had worked in for years. Younger, newer employees found the cutting-edge augmented-reality technology energizing, and they expressed a sense of pride in being a part of this new approach to working and learning.

The advantages of immersive learning for the individual and the organization are significant. At the organization level, an adaptive workforce can more easily adapt to change, learn new technical skills and contribute to a more collaborative culture. At the individual level, there is greater engagement and job satisfaction. According to the American Upskilling Study, more than half of production employees want to participate in an upskilling program, yet less than 40% of them have access to employer-supported opportunities that meet their needs.

Individualized learning

Individualized learning creates engaging experiences that drive true learning and performance for the career needs of each employee. One common challenge is that learning is purchased and delivered in bulk. While, on the surface, this drives attendance in courses, it isn't necessarily the most cost-effective approach to delivering learning, nor is it directly targeted at where learners require the most focus. Employers have an opportunity to provide individualized learning as a differentiator for current and future employees. Individualized learning represents a win-win for employees and employers where employer cost is solely tied to where needs exist and employees' time is

Manufacturing jobs that offer individualized training and a clearer path for career progression are more attractive to recruits.

primarily focused on where they need to develop. Recent research by The Manufacturing Institute[6] also tells us that manufacturing jobs that offer individualized training and a clearer path for career progression are more attractive to recruits and have greater learning retention.

Individualized learning is more than just classroom training. It is about differentiated experiences as well. Mentorship and shadowing are great examples of how experiences can create impactful individualized learning. Many times, when individuals are paired with the right mentors, they quickly get to see adaptive skills in action.

Diverse and intergenerational teams can create rich experiences. "A big issue for all teams, like all orgs, is upcoming retirements," said Grant DeYoung of Emerson Electric. It's important, when hiring younger generations, to transfer valuable legacy knowledge, he added. "We have a mentoring program with those who have been there awhile, and another part is the social aspect, where reverse mentoring happens."

Organizations must also expand existing industry training coupled with custom training solutions for their specific products and workforce to best support all employees as they develop in their careers. Additionally, the organization must identify key talent who embrace change. These employees will need to be involved in pilot programs and new training program rollouts. It's crucial to nurture these early adopters as trainers and influencers in the broader program because these individuals will make natural connections across the program and help to create an interconnected network.

Conclusion and key takeaways

While technology and process are critical factors to achieving data-driven manufacturing, successful transformation begins with people. Viewing the skills gap challenge through a wider lens will help modernize the workforce. Adaptive skills can serve as a differentiating factor to reframe the industry and better attract and retain talent. Investing in their adaptive skills can not only increase the likelihood of future success but also can serve as a vehicle to directly address the current talent shortage. Below are four practical steps manufacturers can take to effectively activate adaptive skills.

1 Infuse adaptive skills into your talent strategy

- Evaluate candidates' experience during the recruiting cycle and determine how to emphasize the opportunities tied to acquiring marketable adaptive skills.
- Identify adaptive skill sets and skills needed in the future through new talent pools.
- Implement adaptive skills development as part of the employee onboarding process.
- Incorporate adaptive skills and related learning opportunities into your employee value proposition.

2 Utilize adaptive skills to create new career paths

- Provide employees the autonomy to identify future roles and proactively develop their skill sets to own their career development.
- Clearly define the capabilities needed for success across all levels and articulate to employees how adaptive skills are essential in roles across the organization.
- Offer assessments that provide employees the opportunity to understand their fit, where individual skill gaps may exist and how they can address those gaps via individualized learning opportunities.

3 Create an adaptive culture

- Anchor around a common purpose. A common purpose can promote and reinforce behaviors and skills required to be successful. For example, in manufacturing, safety could be a grounding purpose where individuals can use adaptive skills such as intellectual curiosity to identify how to maintain safety but also continue to improve efficiency.
- Identify your influencers and utilize them as catalysts to realize and reinforce your desired culture.

4 Invest in individualized learning

- Create space for employees to develop their adaptive skills through individualized training curricula that require applying adaptive principles in the work context. This will provide greater skill development, reduce proficiency speed, and meet their specific needs.
- Collaborate early and often with vocational schools and involve your employees in vocational learning.

Research methodology

These insights are based on the EY and Oxford Saïd School of Business's research on transformative leadership and the EY and Manufacturing Institute's research on adaptive skills in manufacturing.

The EY and Oxford Saïd School of Business' research is composed of both qualitative and quantitative interviews. In it, 935 CXOs and their direct reports and 1,127 members of the workforce provided responses to the quantitative interviews. These CXOs and members of the workforce were split across industries and sectors, including Advanced Manufacturing and Mobility, Consumer Goods, Energy and Resources, Financial Services, Government, Health Sciences and Wellness, and Technology, Media and Entertainment Telecommunications.

EY and Oxford Saïd School of Business researchers conducted qualitative interviews with 25 senior leaders across more than 10 sectors. The sectors included Real Estate, Finance and Banking, Motor Sports, Consumer Goods, and Health Care. Interview participant titles include DEO, CTO, COO, chairman and managing director.

EY and The Manufacturing Institute researchers conducted interviews with 18 manufacturing industry leaders. Interview participants held leadership roles across the industry, including in Industrial Products, Chemicals and Advanced Materials, and Building Materials. These individuals held leadership roles at manufacturing organizations in the following functions: HR, Talent Acquisition, Operations, Public Affairs and various executive positions.

Citations

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