

How manufacturers should invest beyond adaptive skills to build tomorrow's workforce



Talent serves as the lifeblood of any business

As manufacturers seek to address the severe talent gap challenging the industry, many also recognize the time has come to elevate it as a strategic priority. To that end, more manufacturers recognize there has never been a more critical time to radically disrupt how we look at capability – our encompassing term for skills, competencies and talent supply across the industry. [As we learned in the 2023 EY-Manufacturing Institute \(MI\) adaptive skills research report](#),¹ which enable individuals to transform their abilities as their demands and environment change, are increasingly viewed as the key to addressing this widening skills gap. However, new research also suggests there is no one-size-fits-all approach for manufacturers seeking to revamp their manufacturing and training programs. This means that manufacturers need to be prepared to tailor their upskilling strategies to fully realize transformative benefits.

Amid ongoing market pressures driven by the current geopolitical climate, inflation and supply chain disruptions, this capability gap in manufacturing is emerging as an increasingly critical challenge for the industry to solve as it looks to the future. The capability gap has been shown to have a direct impact on manufacturers' ability to make strategic decisions and take meaningful actions to address these market pressures. National Association of Manufacturers' "This is



Manufacturing's Moment" paper² noted that 59.1% of their outlook survey respondents said the inability to find enough qualified workers impacts their decision to make investment plans or to expand.

An increasingly dynamic and competitive environment will favor resilient manufacturers that can pivot quickly in response to emerging challenges, opportunities and rapidly shifting market trends. To underscore the dynamic environment, we looked at recent data from [EY Skills Foundry™](#), an artificial intelligence (AI)-enabled upskilling and reskilling platform that analyzes hundreds of thousands of job postings from various market data sources. The review of the skills and micro-skills relevant to manufacturing showed that over 650 skill evolutions have occurred over the last six months alone.

The ongoing digitalization of the industry also requires manufacturers to reskill their workforce. The [2023 EY-MI adaptive skills research report](#) found that manufacturing organizations that emphasize adaptive skills development are more likely to unlock a competitive advantage, accelerating their transformation and directly addressing the manufacturing skills gap. The research went on to demonstrate that adaptive skills represent the critical translation point necessary for reskilling the current workforce and to rebrand, attract and retain new talent pools.

In addition, forward-thinking manufacturing organizations have found that adaptive skills are the key first step for revealing compelling alternative career paths on the shop floor, paving the way for employees to access new roles and opportunities and to learn future-focused skills that will prepare them for the transition needed to thrive in tomorrow's workforce.

As we learned in the [2023 EY-MI adaptive skills research report](#) adaptive skills often serve as the transformative currency for developing new competencies that significantly enhance the trajectory of a worker's career path.



Our research also uncovered several critical questions that manufacturers need to resolve to maximize their investments in talent development. This study is grounded on answering the following:

1. While adaptive skills are a key piece of the puzzle to unlock, are there other skills that are also critical?
2. Where should manufacturing organizations invest across the categories of future-fitted skills?
3. What areas should manufacturing organizations invest in differently to nurture a culture of continuous learning and development?

Manufacturers that successfully answer these questions and embrace an adaptive culture will improve the likelihood that they will design and deploy training programs that meet the needs of their current and future workforce. In this paper, we will touch on how manufacturing organizations can step up to meet the challenges of building an adaptive workforce and deliver even stronger returns on their investment in training programs.



1

There are clear “building block” skills manufacturers must differentially invest in

Our research did not uncover a “silver bullet” for solving manufacturing talent challenges, but we did identify next-generation skills that serve as foundational building blocks for nurturing organizational transformations and future-fitted talent growth. Next-generation skills don’t only include skills of the future but also those skills that will enable the transformational journey.

There continues to be resounding support for manufacturers to invest in adaptive skills. In addition to this clear area of focus, other priority skill categories are critical to future fitting the industry, namely digital, technical and process-related competencies. The culmination of these four categories embodies the next-generation skills for manufacturing, which enable all generations in the workforce to advance, adopt new ways of working and link capability to business demand.

- ▶ **Adaptive:** skills that enable the workforce to transform their abilities as their demands and environment change
- ▶ **Digital:** core skills that enable the workforce to interact with, analyze, and program digital technologies and applications
- ▶ **Technical:** specialized knowledge and/or expertise that enables the workforce to perform tasks on the shop floor
- ▶ **Process:** base manufacturing process understanding that fosters continuous improvement



Our research identified the top next-generation skills across these categories for manufacturers to develop through targeted learning programs. We discuss these skills in more detail below:

Adaptive skills	Digital skills
<p>Analytical acumen: the ability to understand current business objectives and apply data-driven and lean decision-making thinking to improve efficiency and solve problems</p> <p>What leaders are saying ... “It is important to have a deeper understanding of processes. Employees need to be able to take all kinds of data from our systems and interpret it to solve problems.” – Sam Rice, PepsiCo</p>	<p>Data and analytics: the ability to extract, standardize and aggregate data into meaningful data sets and then analyze and visualize that data in a way that can inform decision-making</p> <p>What leaders are saying ... “We have lots of data feeds and places where data is stored. An employee of ours recently updated our data platform to allow for a more structured intake of data. It is now much easier to build out visualizations.” – John Bertz, Armstrong World Industries</p>
<p>Critical thinking: the ability to creatively perceive patterns that are not obvious and even ones that are possibly new</p> <p>What leaders are saying ... “If someone is performing a calculation on a cell count, they should have the critical thinking ability to recognize when that calculation is off. When something goes awry in these calculations, it can result in the patient waiting an additional six to eight weeks for treatment.” – Bob Bowden, Johnson & Johnson</p>	<p>No-/low-code applications: the ability to leverage no- or low-code applications to aggregate, analyze and visualize data insights, identify trends, and drive informed, strategic decision-making</p> <p>What leaders are saying ... “Power BI and Excel ... we operate in that world. We use these tools because they are no-cost applications. You have to have digital literacy skills to take that data and produce meaningful results.” – Zach Parsch, Dow</p>
<p>Communication/collaboration: the ability to select and use the most appropriate means of communications from a range and methods and styles, coupled with the ability to work together as a team and unleash the collective potential of the team</p> <p>What leaders are saying ... “We have interdependencies between departments that require collaboration and a team-first mentality, so that is always top of mind.” – Magda Dexter, Saint-Gobain North America</p>	<p>Program manufacturing machines/devices: the ability to manage data collection devices (i.e., IoT sensors, PLCs, HMIs, SCADA systems, CNCs, etc.) to manufacture more efficiently</p> <p>What leaders are saying ... “We are advancing our online sensors. We are working with another company to advance signal pickup and pattern identification. This space keeps evolving and the ability to have people think the way these technologies think is important.” – John Bertz, Armstrong World Industries</p>

Technical skills	Process skills
<p>Complex assembly: the ability to produce goods by assembling smaller products at different steps in a sequence to produce the final product</p> <p>What leaders are saying ... "You don't really have simple assembly in the US so much anymore. Instead, it's electronic assembly and schematics. As technology continues to evolve, our technicians need to be able to do the same." – Kristin Fritz, Rockwell Automation</p>	<p>Process improvement: the knowledge of activities and tasks related to analyzing and improving existing manufacturing activities to improve efficiency and effectiveness</p> <p>What leaders are saying ... "Our best or substantial (process improvement) ideas have come from our front-line teammates. When something is slowing them down, teammates are empowered to raise those issues and are incentivized to do so through a weekly bonus based on efficiencies." – Tim Hosty, Nucor</p>
<p>Robotics: the ability to use robotics and software with artificial intelligence (AI) capabilities to handle high-volume, repeatable manufacturing tasks that previously required humans to perform (i.e., queries, calculations, maintenance of records and transactions, etc.)</p> <p>What leaders are saying ... "I think we have recognized quickly how difficult it was going to be to find the right kind of technicians to work on robots. Finding that skill set has been one of our biggest challenges." – Karla Bonzie, Dover Food Retail</p>	<p>Root cause analysis: the ability to identify underlying conditions that are creating issues with a machine or system</p> <p>What leaders are saying ... "When working with automated machines, employees need to have some background understanding of what's going on as opposed to just pushing buttons. If something goes wrong, they have to have the problem-solving ability to identify the issue." – Zach Parsch, Dow</p>
<p>Machine maintenance (proactive and prescriptive): the ability to diagnose, troubleshoot, and repair various types of manufacturing equipment or machinery to ensure optimal performance, functionality and longevity</p> <p>What leaders are saying ... "The experience of our customers has vastly improved because our live service technicians have the ability to anticipate problems in the field before they occur." – Kim Bors, Dover</p>	<p>Occupational health and safety: the knowledge of processes and regulations which ensure engineered systems and manufacturing practices provide acceptable levels of safety and meet compliance requirements</p> <p>What leaders are saying ... "Occupational health and safety awareness is a critical skill set that we look for when recruiting new talent." – Omar El Komy, Cox Automotive</p>

To build a sound foundation of next-generation skills that enable effective transformations and future-fitted workforces, manufacturers need to leverage learning curriculums that blend the four categories of next-generation skills. For example, the MI's Advanced Manufacturing Technician (AMT) program provides a meaningful proof point to supplement the validation we received from study participants. The AMT program, which takes an industry-leading approach to upskilling, currently has over 1,150 students sponsored from a nationwide network of over 450 active and supporting manufacturing partners. These manufacturers range from large global corporations to local family-owned businesses across various verticals such as automotive, oil and gas, paper and pulp, metal working, woodworking, chemical, energy, and food and beverage. Originally founded by Toyota and managed today by MI, the AMT program has evolved to not only focus on

core professional and traditional manufacturing competencies (such as mechanical, electrical and fabrication) but also future-fitted skills across all next-generation skill categories. This versatile approach equips employees who complete the program with the required capabilities to evolve and thrive alongside organizational and role-based transformational journeys.

The AMT program helps reinforce that we have identified the skills that matter in manufacturing for the foreseeable future. This is critical. However, with finite resources, manufacturers need to know how to prioritize their investments in upskilling for maximum return.

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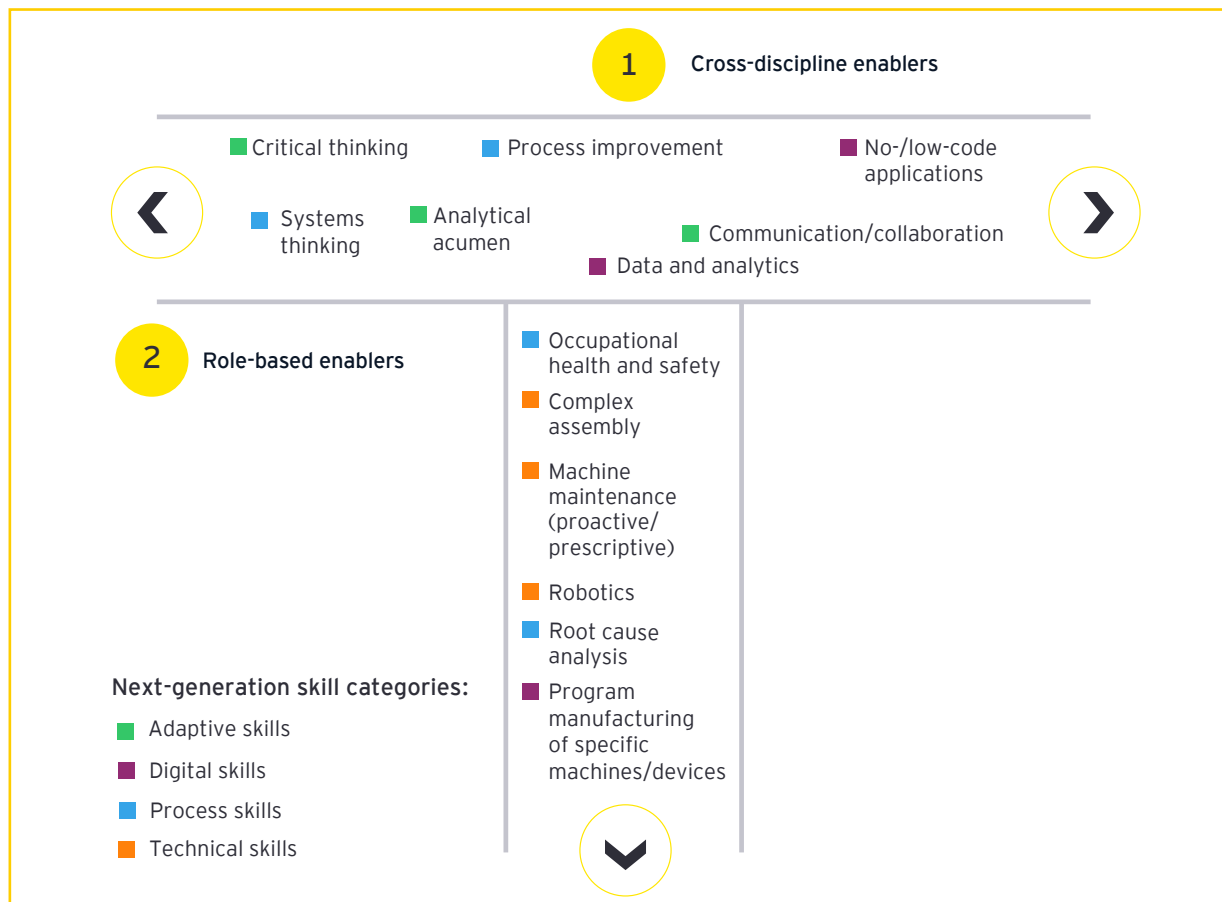
The Advanced Manufacturing Technician (AMT) program has demonstrated tangible results for fostering successful role evolutions. For example, a participant who began training with basic programmable logic controller (PLC) skills was requested to transition into a full manufacturing execution system (MES) role and, due to her experience and upskilling through AMT, was able to excel leading MES for her organization.

– Tony Davis, Manufacturing Institute

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The manufacturing “T” defined

Through interviews and a broader study of leading manufacturers, we discovered that the most meaningful skills across the four categories of adaptive, digital, technical and manufacturing skills (our next-generation building blocks) also comprise a T of capability.



1 Cross-discipline enablers (top of T): The top of the T represents next-generation skills that are transferrable across roles and thus need to be trained broadly across the organization. These skills provide a critical foundation that accelerates organizational transformation, aligning directly with Manufacturing 4.0 transformation and digitalization requirements. In addition, these skills are central to breaking down siloes, serving as a critical step for inspiring innovative thinking in new and unexpected areas.

Cross-discipline enablers are applicable across the organization in all roles and ranks. For example, Meg Brown of Cambridge Air Solutions adds that

building the skill of business acumen helps all levels and functions to feel ownership of business KPIs. “We have significant internal processes that are pointed at developing business acumen. Our organization is very financially transparent. We have a 15-minute stand-up call that everyone from leadership to the shop floor attends. We talk about metrics every day and when issues arise, leadership grabs the microphone and explains what happened. It’s less about formal training and more about the atmosphere you create. All our employees feel ownership for driving results here.”

Cross-discipline enablers serve as a bridge for talent to industry segments that are still immature,

fragmented or yet to be defined. For example, as electric vehicle (EV) production becomes more important in the effort to reduce global emissions, the production of batteries for these vehicles is taking on greater importance. However, with limited existing talent pool in this space, many companies must hire for baseline skills and then develop highly specific capabilities through training. Omar El Komy of Cox Automotive adds, “EV battery is an entirely new space. There are no standard or centralized ways of working due to the immaturity of the industry. That means there are very few resumes that have deep experience in remanufacturing batteries. Instead, we have to bring someone in and teach them from scratch. This makes soft skills the most important skills for us to recruit for.”

To that end, cross-discipline enablers also help manufacturers source alternative talent pools from other industries and create internal talent mobility. One company is actively recruiting HVAC technicians who have transferrable skills who can be retrained to work on refrigeration. “The thermodynamic cycle is the thermodynamic cycle,” says Karla Bonzie of Dover Food Retail. “Due to refrigeration being a niche space, we are focused on bringing in HVAC technicians and retraining them to work on our products. It’s the same skill set, just a different application.” Focusing on building skills that are adaptable across various areas of the shop floor can also provide workforce flexibility. Sean Maguire of Cambridge Air Solutions shared, “We’ve built cross-training across three manufacturing lines, which has enabled the development of agile teams that can be deployed across various areas of the production floor in order to effectively meet production metrics and combat hiring challenges.”

2 Role-based enablers (bottom of T): Our interviews also determined a range of next-generation skills that are focused on addressing the direct role evolutions experienced by the production workforce. These evolutions include the shifts in role expectations to hold multiple roles at once, transition from physically taxing to mentally stimulating job duties, drive connectivity across the end-to-end manufacturing processes, and directly interface with digital tools with multigenerational production assets. Developing these skills accelerates the production workforce’s ability to effectively evolve alongside the changing shop floor, while enabling improvements in productivity, employee experience, quality and safety.



The rapid introduction of automation and enabling technologies are transforming the way in which tasks are performed on the shop floor. Data capture and reporting processes, for example, were previously manual, but now as John Bertz of Armstrong World Industries noted, “Shop floor employees are pulling data signals off the line to identify issues.”

Role evolutions are significantly changing the skills required to be productive on the shop floor and create challenges with sourcing qualified talent. Kristin Fritz of Rockwell Automation spoke to the evolutions of required analytical skills for automation and maintenance technicians, adding “We’re looking for people who are good at fixing problems, but also have the analytical skills needed to anticipate them ahead of time.”

In addition, role-based manufacturing skills are becoming increasingly complex due to the introduction of enabling technologies. “Complex system basics need to be understood to effectively work alongside emerging technology and move into a role that advances and supports automation,” says Sam Rice of PepsiCo.

Segmenting these skills across the T construct helps employers to thoughtfully organize capability development further than simply the foundational building blocks. As demonstrated above, clear adjacencies and even synergies can be found to advance this effort.

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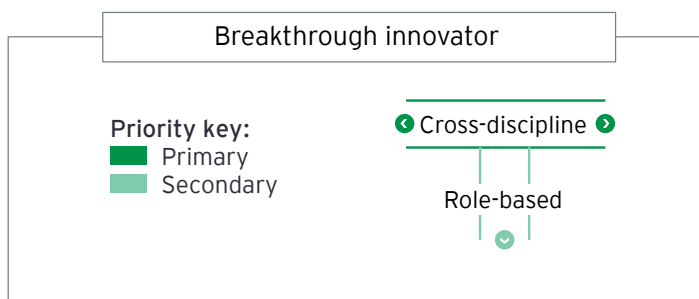
To be economically rational, manufacturers must invest in next-generation skills based on their business needs

The T of capability provides a holistic perspective on the critical capabilities of tomorrow; however, investing equally across the T is likely unrealistic for most organizations. Therefore, manufacturers need to first reflect on their organizational purpose and strategy to determine where they are versus where they want to be, so that they can take intentional, targeted and meaningful action accordingly. Depending on factors such as organizational size and scale, industry maturity, and appetite for disruption, manufacturers should prioritize their investments in cross-discipline (top of the T) vs. role-based enablers differently (bottom of the T). Manufacturers with strategies focused on radical disruption must first prioritize cross-discipline enablers, which will allow the workforce to navigate the transformational journey, before identifying the role-based enablers

that will be required in the future state along with the skills that will accelerate the path to get there. On the other hand, manufacturers who are striving to build a fit-for-purpose workforce must first prioritize role-based enablers. This step will empower employees to successfully embody desired ways of working before manufacturers focus on the cross-discipline enablers, which will allow them to drive behavior change at scale. It became clear through our research that there is no one-size-fits-all approach to the T. Each organization will have its own considerations and application; however, to help organizations to apply the T, we defined four archetypes that organizations can use to self-identify with to inform their approach to investing in next-generation skills across the T of capability.

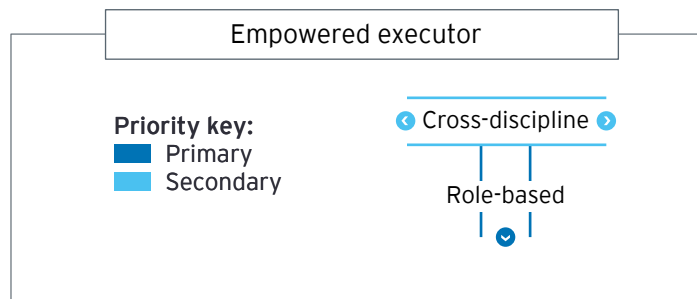
The breakthrough innovator: Agile manufacturing organizations in nascent and emerging industries focused on rapid growth while also working toward increased standardization. For these companies, available talent pools with applicable skills are often limited due to the relative immaturity of the industry and a lack of existing standardization. In addition, existing workers might be required to play multiple roles or to change their remit quickly. As such, manufacturers must look to alternative means to build a viable workforce.

- ▶ **Applying the T:** Hiring for and developing cross-discipline enablers are critical steps for manufacturers that fit this archetype. This must be done prior to investing in role-based enablers since in many cases to individual roles haven't been defined or are rapidly evolving. Building a workforce that can adapt to continuous evolutions and non-standardized processes will help position these manufacturers to transform as their industry matures. At the same time, it helps them lay a critical foundation for identifying end-to-end opportunities for process improvements and progress toward standardization.
- ▶ As the industry matures, manufacturers can then prioritize upskilling around role-based enablers to implement standardized skill frameworks that are tied to defined roles and proficiency requirements.



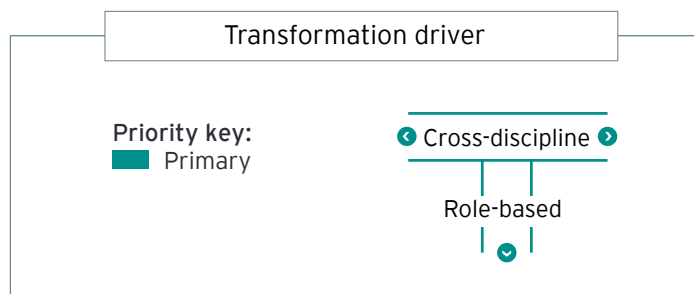
The empowered executor: This consists of stable manufacturing organizations in well-defined industries that need to strongly emphasize and enhance process efficiencies by introducing more enabling technologies on the shop floor. The implementation of enabling technologies has inspired significant evolution within production roles. This may include introduction of automation and robotics, as well as the overlay of new technology onto legacy manufacturing assets including digital elements such as sensors and programmable logic controllers. In many cases, this results in a broader complement of multigenerational assets in the production environment.

- ▶ **Applying the T:** Manufacturers that fit within this archetype must prioritize reskilling investments on developing role-based enablers, as the production floor workforce experiences the greatest impact resulting from the introduction of these technologies. To that end, they should deploy role-based skill development, starting with entry level roles. They can then prioritize cross-discipline enablers to facilitate career advancements and prepare the workforce for movement into roles at the middle-management level.



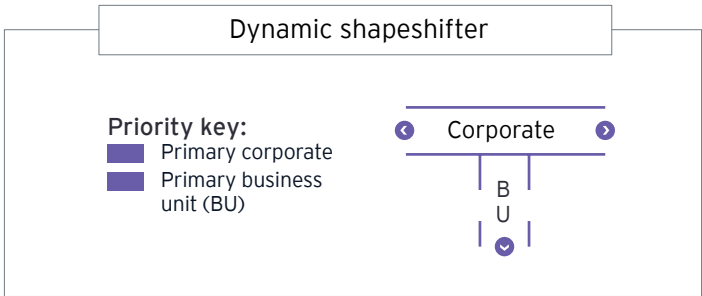
The transformation driver: This consists of well-established organizations who are seeking to expand in evolving industries by focusing on driving digital transformation to scale and to become future fit. Amid ongoing evolutions on both the industry and production floor fronts, manufacturers seek to identify where they must prioritize skill investments to accelerate transformation and enable a future-fitted workforce.

- ▶ **Applying the T:** Manufacturers that fit this archetype must prioritize a balance of both cross-discipline and role-based enablers by each team/function. To address shifts in skill requirements, they must make role-based enablers a priority due to the introduction of enabling technologies while also working in cross-discipline enablers, which will accelerate adoption at scale. This will require tight alignment to the broader organizational strategy but also site-specific objectives to drive the prioritization of skills across the T.
- ▶ By piloting initiatives to reskill investments in role-based enablers and combine them with a cross-discipline mindset, teams and functions can scale these investments across the organization. This combination can be a key factor for accelerating the time required to invest in upskilling strategies and deliver key lessons from the pilot to facilitate faster adoption and shorter feedback cycles.



The dynamic shapeshifter: This consists of dynamic organizations spanning multiple industries and focusing on building multifaceted capabilities through acquisitions, investments and hiring. Due to the complexities of skills and operating models seen at many large-scale conglomerates, the manufacturers face significant challenges, including (but not limited to) organizational siloes, standardization efforts and talent mobility across the organization.

- ▶ **Applying the T:** The application of the manufacturing T will differ depending on whether the strategy is applied at the corporate or business unit level. Strategies that start at the corporate level often emphasize centralization, while the business units have an incentive typically desire strong autonomy to make strategic decisions based on the unique needs of their business. To effectively facilitate reskilling investments, prioritization of the T segments must cater to the variances in strategic focuses at the corporate and BU level. Corporate should focus reskilling investments on cross-discipline enablers to drive collaboration and communication across organizational siloes, analytical and data-driven decision-making as well as end-to-end process improvements. At the business unit level, the focus on reskilling investments should feature role-based enablers that meet the requirements of the specific business strategy.
- ▶ As business units identify role-based enablers, they should collaborate with corporate to help identify transferrable role-based skills that can be leveraged across the enterprise to facilitate talent mobility across business units and organizational siloes. This collaboration is critical to avoiding gaps or duplication in talent investments.





3

An economic approach to reskilling investments is the key to unlocking the desired ROI

When evaluating whether reskilling investments are economically sound, manufacturers must evaluate three critical components – skill definition, skill assessment and learning experience value. The following three questions focus on identifying the right skills, assessing employee values and aligning learning delivery with engaging mechanisms.

Are we investing in the right skills?

Our research revealed that manufacturers are not investing in the right skills. Manufacturers are hardly alone in this, however. According to the World Economic Forum's The Future of Jobs Report 2023,³ less than 50% of organizations prioritize developing next-generation skills within their own organization. Therefore, manufacturing organizations are looking to acquire next-generation skills in an extremely competitive external market, instead of leveraging internal investments to facilitate upskilling of existing talent. This includes sourcing salaried role profiles as compared to the development of the production workforce to fill these gaps.

While external sourcing may help manufacturers close the skills gap quickly, it is the most expensive response to the problem and, in many cases, represents a short-term fix as it can be extremely hard to find talent with a skill set that will be fully utilized and drive cultural assimilation. To that end, manufacturers must take a forward-looking approach to reskilling to achieve sustainable talent longevity.

For example, PepsiCo has a success rate of greater than 90% when positions are sourced internally. "Employees that go through our internal trainings do better than employees we outsource for. Our trainings do a good job of preparing internal employees for their role," said Sam Rice of PepsiCo.

Manufacturers must identify and invest in a customized combination of next-generation skills which adhere to the business requirements of their organizational archetype and foster internal talent pipelines that serve as a sustainable strategy to battle the exceedingly competitive external talent market.

Are the skills we are investing in desirable to employees to improve attraction, retention and employee experience?

We have seen clearly that when manufacturers invest in the right skills, they create a win-win for the employer and the workforce. In the [2023 EY-MI adaptive skills research report](#), we saw that manufacturing jobs that offer individualized training and a clearer path for career progression are more attractive to recruits and have greater learning retention.

Investments in the professional growth of an individual are recognized by employees. "Employees realize that the skills that we are helping them develop will be beneficial to their career even if they leave Emerson. There is a correlation to retention after completing trainings," said HR leaders from Emerson's manufacturing verticals. These investments not only are recognized by employees, but empower them to feel adequately prepared to perform their required responsibilities and accelerate their speed to productivity.

Tamara Clark, at Canam Steel Corporation, adds that when companies establish their own training programs, it enables employees to feel "confident that they have the ability to perform the responsibilities of their job."

Employer investments in upskilling have proven to show a longer-term positive impact with respect to employee engagement, retention and satisfaction. As seen in the 2024 Workplace Learning Report,⁴ strong learning cultures can drive direct benefits related to retention (57% increase), flexible career paths (23% increase) and promotions to management roles (7% increase) when compared to baseline learning cultures.

Skill investments must be focused on maximizing employee potential and serve as the transformative currency to facilitate career mobility, career advancement and value-based learning. Upskilling programs that create an individualized employee experience grounded in resulting benefits will nurture a culture of continuous learning and loyalty to the employer.



Are manufacturers investing in skills with the right intensity?

Conversations and interactions with a variety of manufacturers reveal that many are struggling to find the right answer on how to deliver enough development opportunities that will be impactful without wasting time and resources. Unfortunately, many manufacturers invest in training by relying on a one-size-fits-all approach that aims to provide uniform coverage rather than focus on a specific, individualized more economic approach to developing skills.

Manufacturers that leverage a one-size-fits-all approach to reskilling as compared to tailored reskilling investments based on the needs of the individual and organization are missing a tremendous opportunity to develop a personalized and value-driven learning strategy. One example of making targeted investments came from Nucor, who highlighted the value of partnerships with academic institutions. “We’ve partnered with local colleges, and we are able to create courses dependent upon specific skills or trainings that an individual needs,” says Tim Hosty. This is an example of balancing business investments across business and individual needs.

While offering targeted development experiences is key to delivering at the right intensity, learning adoption remains critical. Central to adoption is the desire by employees to learn within given areas. Another investment approach is to create incentives for acquiring key skill sets. As Dover Food Retail’s Karla Bonzie noted, “We started a pay-for-skills program. If employees want to advance at the company, they are incented to do so. People need to see that they have opportunities at our company for progression and learning. The younger generation wants quick progression and are very interested in utilizing this program. This pay-for-skills learning opportunity helps us with retention among our earlier career employees.”

Manufacturers must shift the intensity of investments to targeted upskilling strategies, which create an equitable balance across employee and organizational needs. These investments should include a robust focus on the identification of required skills, the alignment of these skills with organizational skill frameworks, and the implementation of learning modalities and incentives that foster learning desire.





The tailored approach

With the information gathered above, the immediate question becomes “what is a practical approach to bring these next-generation skills to fruition?” We define success to be when an organization is able to monetize skills, meaning they fully understand the economic impact of skills. This includes direct value or ROI but also more intangible benefits such as increasing the intellectual knowledge of your organization.

Here's a step-by-step approach for designing a more tailored approach.

Step 1: Streamline next generation skills frameworks and connect them to organizational objectives

Tailored approach	What outcomes can be expected?	What does this look like in practice?
<ul style="list-style-type: none"> ▶ Clearly define your roles by creating thoughtful job profiles aligned to industry trends as well as current and future business strategy. Creating a quality, defensible job profile is most important. ▶ Create a global skills inventory, with clear definitions associated with each skill. Having one source of the truth is essential to effectively anchor talent activities. Too often, employers have multiple skill descriptions which creates unnecessary complexity. ▶ For each role, create proficiency requirements that outline different levels of skill mastery. This is particularly helpful to connect learning and development experiences to roles and talent. While this task seems daunting, AI-driven capabilities can now perform this mapping to significantly accelerate the process. ▶ After aligning skills to roles, identify opportunities to assess the organization and employees against the desired skills using algorithms and/or other forms of statistical analysis. 	<p>By connecting next-generation skills to roles using the recommended tailored approach, manufacturers can expect the following outcomes:</p> <ul style="list-style-type: none"> ▶ Universal and standardized role-based skills frameworks that are aligned to industry trends and the business objectives of your organization ▶ Common language through skills across and organization's talent management strategy, lifecycle and experience ▶ Data-driven proficiency requirements that meet employees where they are today and create tangible paths for forward progression ▶ Enhanced ability to conduct comparable market analysis for roles across your organization, assess skill health and market evolution at a skill level ▶ Individualized learning strategies that accelerate the closure of critical skill gaps and clear pathways to develop skills for all employees 	<p>Dow is currently defining the individual skill sets required in each of their manufacturing roles to set up their employees for success.</p> <p>"We are working on a skills-based learning model and are developing a defined list of skills required to be successful for each individual role. The vision is to have baseline skills for each role, and additional skills that must be developed in order to progress to mastery," says Zach Parsch.</p>

Step 2: Enable employees to own their careers

Tailored approach	What outcomes can be expected?	What does this look like in practice?
<ul style="list-style-type: none"> ▶ Use skills and roles to create career paths across the organization. Establish skill hierarchies to describe development pathways within each role and career path. This provides clarity for employee development, promoting job satisfaction and retention. ▶ Map existing learning curriculum against learning pathways to ensure learning and development resources and programs provide clarity for progression. Identify and address gaps in curriculum, out of date content, redundancies (optimize expenditure) and instances requiring more immersive learning (for critical activities, e.g., safety, quality, complexity). ▶ Invest thoughtfully in user experience-oriented technology that will deliver a seamless experience for employees to navigate their career path and to identify alternative career paths that they may wish to pursue. ▶ Provide learning accessibility to drive engagement and learning demand by removing or reducing barriers to learning such as cost or time constraints. Additionally, proactively identifying ways to connect learning to individuals with special needs is a critical consideration as well. 	<p>By assessing upskilling pathways using the recommended tailored approach, manufacturers can expect the following outcomes:</p> <ul style="list-style-type: none"> ▶ Role-based skills frameworks, which provide visibility to career path opportunities and empower employee ownership ▶ Optimized learning curriculums that facilitate progression and eliminate wasted effort and cost ▶ Increased learning demand and intentional employee utilization of provided resources ▶ Clarity on learning program quality and guidance on where investments need to be made for core skill development and advanced learning solutions that are critical to business success 	<p>PepsiCo is using an AI-enabled platform that allows employees to evaluate how their existing skill profile aligns with other roles within the organization and the upskilling that will be required to get there.</p> <p>The company has also implemented two programs that provide learning accessibility at zero cost to the employee.</p> <ol style="list-style-type: none"> 1. Digital Academy – offers more than 11,000 digital learning assets to drive digital skill proficiencies across multiple levels in the organization 2. MyEducation – provides access to over 100 diploma, certificate, and degree options across a variety of fields

Step 3: Invest in immersive learning and celebrate success

Tailored approach	What outcomes can be expected?	What does this look like in practice?
<ul style="list-style-type: none"> ▶ Provide experiential project opportunities and rotational short-term assignments as a compliment to the formal learning curriculum to offer immersive experiences that allow employees to develop new skills and build competencies in a low-risk environment. ▶ Capture and share leading practices and storytelling through technology. This facilitates organization-wide impact, as well as individual recognition. The organization's culture, values and impact are retained and accessible instead of remaining in the heads of a few. ▶ Develop a learning culture where individual development is promoted and encouraged, resulting in engaged and active employee development. Make learning programs and experiences appropriate (match learning experience to performance demands), accurate (up to date and inclusive of best practices) and consumable within the demands of the workplace and the environment. ▶ Highlight success stories that result from targeted reskilling investments. The Advanced Maintenance Technician program has accelerated promotion timelines for certain manufacturers, where a typical promotion track from team member to team lead can take seven to 10 years, yet participating employees have achieved this growth in four to five years. 	<p>By investing in more meaningful learning experiences using the recommended tailored approach, manufacturers can expect the following outcomes:</p> <ul style="list-style-type: none"> ▶ Increased job satisfaction and reduced risk of employee attrition due to misalignment between role requirements and employee expectations ▶ Accelerated speed to productivity resulting from curriculum alignment with tangible role responsibilities ▶ Established culture of continuous learning where employee growth and development is visibly celebrated and rewarded 	<p>Rockwell Automation has taken an immersive approach through their supply chain rotational program.</p> <p>“We are leveraging an internal leadership development program to assist with helping new hires start their careers in supply chain, they rotate through various departments to understand the types of roles that interest them and develop the skills that would be needed in an immersive format, prior to being able to make a decision on where they start their career,” says Kristin Fritz.</p>

Step 4: Build your business case with meaningful measurement

Tailored approach	What outcomes can be expected?	What does this look like in practice?
<ul style="list-style-type: none"> ▶ With proficiency as a foundation, build reporting capabilities to evaluate how effectively you are developing organizational proficiency. To that end, assess your skill health organizationally over time, by department and by individual. Allowing the individual to see their own progression motivates development and the organization can determine how their workforce is adapting to future workforce demands. ▶ Use learning mediums and feedback within learning to evaluate learning effectiveness. Leverage these measures to refine learning delivery to improve proficiency levels coming out of the learning experiences. ▶ Connect skills using internal role cost and external role data to understand the value of skills. This will support buy vs. train decisions for employees. It will also provide insight into the value of talent practices across an organization. ▶ Link learning experience to the overall employee experience and broader business outcomes. For example, manufacturers that consistently connect the employee experience directly to broader business outcomes often achieve significant results. 	<p>By implementing meaningful measurement using the recommended tailored approach, manufacturers can expect the following outcomes:</p> <ul style="list-style-type: none"> ▶ A clear, defensible business case for further investments in training, learning and development with demonstrated ROI ▶ A mechanism for tracking progress in growing skill proficiencies and evidence of skills gap closure ▶ Actionable feedback, which can be used to further improve learning and development resources to better-fit employees wants and needs ▶ Greater employee ownership of business outcomes and KPIs to drive accountability across the organization 	<p>Canam Steel Corporation is tracking KPIs on the shop floor to evaluate training effectiveness.</p> <p>“Every production line has screens that show employees where they are at in the production schedule for the day (KPIs). Are they currently in the red, yellow or green? This makes the KPIs visual, which helps. Most of our employees like the challenge and want to be more productive,” says Tamara Clark.</p>

Conclusion and key takeaways

In such a dynamic environment where competition for talent remains cutthroat, within and outside of the industry, manufacturing organizations must take decisive action to win the competition for talent both today and in the future. By applying the lessons of this research, manufacturers can make decisive talent investments that will deliver meaningful, lasting impacts for their workforce.

While conducting this study, we gained several insights on the steps manufacturers can take to create and nurture a culture of continuous learning and skills development. For example, manufacturers need to:

1

Prioritize developing a distinct set of complementary manufacturing skills.

2

Build a manufacturing T as a core foundation that is focused on both cross-discipline skills and role-based skills.

3

Apply the manufacturing T with targeted intent. Aligning with the core characteristics of their organization will further this approach.

Manufacturing organizations that can best harness this economic approach to skills will be poised to achieve better business and talent outcomes. Organizations that get this right can expect greater skill proficiency across their workforce, increased productivity, decreased talent costs and positive changes to their shop floor culture. However, organizations that fail to carefully tailor their skill investments may experience more challenges with widening skill gaps, resiliency of their workforce to disruption and overall employee retention.

Talent is central to the success of any business. In manufacturing, however, intellectual capital, agility and ingenuity have emerged to become a core feature of sustained success in the industry across a variety of meaningful metrics. The key question facing manufacturers over the next five to 10 years and longer will be whether they should continue to focus on traditional approaches and hope to close the talent gap or will they be prepared to take meaningful, targeted actions, as outlined in this paper, to realize transformative outcomes for their people and their business.



Research methodology

These insights are based on the 2024 EY-MI research on next-generation skills in manufacturing and the 2023 EY-MI research on adaptive skills in manufacturing.

For 2023 adaptive skills research, the research team 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.

For 2024's next-generation skills research, the research team conducted interviews with 19 manufacturing industry leaders. In addition to the interviews, participating leaders completed a pre-interview survey, providing quantitative and qualitative data to inform the top next-generation skills across adaptive, digital, technical, and manufacturing categories, critical skill gaps, highly proficient skills, and employer-valued investments to address the skills gap. Interview participants held leadership roles across the industry, including in industrial products, chemical and advanced materials, automotive, life sciences manufacturing, food and beverage manufacturing, and building materials. These individuals held leadership roles at manufacturing organizations in the following functions: HR, operations and various executive positions.



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US SCORE no. 23169-241US

2401-4413254

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