Closing In on the Industrial Manufacturing Skills Gap

How the industrial manufacturing sector can build and upskill a future-proof workforce to combat labor shortages and the challenges of Industry 4.0

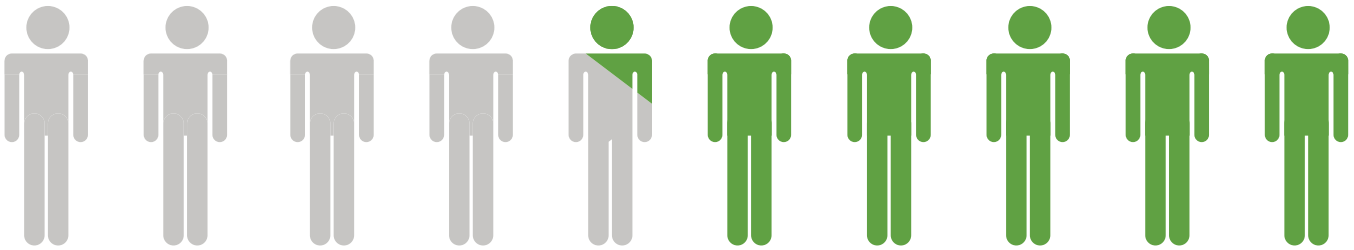
SOLID Professor

In this Guide

Introduction

The industrial manufacturing labor shortage is not a new phenomenon, but it continues to make headlines as the skills gap widens and demand for innovative solutions increases. A 2018 study[1] from Deloitte and the Manufacturing Institute estimates that the industry could face **2.4 million unfilled positions** over the next decade. This disparity, if left unaddressed, could result in **$2.5 trillion** in foregone economic output.

At the center of this issue is a widening skills gap. This gap makes it a major challenge for employers in industrial manufacturing to attract and acquire skilled talent. However, hope is not lost — taking steps to address the skills gap and change up the hiring process can ensure manufacturing and engineering teams are equipped for the future.



2.4 million unfilled positions over the next decade

[1] Deloitte, Manufacturing Institute. 2018 Deloitte and The Manufacturing Institute skills gap and future of work study. 2018.

Industry Outlook

With **Industry 4.0** on the horizon, the industrial equipment and machinery industry has an exciting future full of cutting-edge opportunities. Many organizations within the industrial manufacturing industry are already doubling down on digitization — 72% of manufacturing companies[2] are working to be digitally advanced by 2020, and plan to dedicate over **$900 billion per year** to integrate new technology and create smarter facilities.

Key Manufacturing Trends in Industry 4.0:

Big Data and Predictive Analytics

Industrial Internet of Things

Virtual/Augmented Reality

Additive Manufacturing & 3D Printing

Artificial Intelligence

The industrial manufacturing industry as a whole is expanding and slated to create **4.6 million jobs** by 2028. Industry sectors including **heavy equipment; packaging machinery**; and **mold, tool, and die** will be growing significantly over this decade and facing new technological challenges.

Heavy Equipment

The global heavy construction equipment industry is projected to reach **$90.4 billion** at a CAGR of 5.4% by 2025.[3]

This industry will be challenged with implementing fully integrated systems and automated processes aided by design for manufacturing.

Packaging Machinery

The global packaging machinery market will be accelerating at a >5% CAGR, growing by **$12.31 billion** in a four-year period (2018-2022).[4]

The packaging machinery sector will need to integrate automation and boost machine performance to stay competitive.

Mold, Tool, & Die

The global market for mold, tool, and die manufacturing is expected to reach nearly **$89 billion** by 2023, growing at >9% CAGR.[5]

This market will be challenged to find innovative ways to manufacture in less time at a reduced cost while maintaining quality.

This kind of anticipated growth coupled with the new advancements in manufacturing technology is motivating companies in these industries to seek out skilled workers in preparation for these shifts. But while there are interesting opportunities, many manufacturers are having a difficult time finding enough qualified people for the job.

[2] PwC. Industrial Manufacturing Trends 2018-19 & New strategies for IoT investment. 2018.

[3] Grand View Research. Heavy Construction Equipment Market Size, Industry Report 2018-2025. Jan 2018.

[4] Technavio. Global Packaging Machinery Market 2018-2022. May 2018.

[5] The Business Research Company. Dies, Jigs, and Other Tools Market, Global Opportunities and Strategies to 2022. March 2019.

The Manufacturing Skills Gap

Why does the manufacturing skills gap exist?

Finding quality candidates for important roles is a challenge in any industry, but the difficulty has been exacerbated in industrial manufacturing in a number of ways. Combined, the following factors have led to an immense skills gap and a shortage of manufacturing labor:

The aging workforce

The engineering and manufacturing workforce is aging across all sectors. About 25% of industrial engineers and 22% of mechanical engineers are over the age of 55.[6] For skilled production workers, the soon-to-retire group is even larger. The Bureau of Labor Statistics reports that **75% of tool and die makers are 45 or older**, and only 2% are under the age of 35.[7]

Waves of senior employees retiring from the workforce will account for the majority (2.69 million[8]) of the 4.6 million open manufacturing positions between 2018-2028. This means that not only will organizations be losing significant numbers of employees, but they will also be losing the most skilled and seasoned workers.

Manufacturing is not seen as a "cool" job

In order to fill the roles left by retiring employees, manufacturers must appeal to younger students and professionals. However, despite widespread support for the "Made in America" emblem, manufacturers are struggling to attract young talent. Uncertainty surrounding the industry's stability and outsourcing practices combined with a common perception that the industry isn't "cool" are the main reasons there's a lack of young people pursuing careers in manufacturing. Americans rate a career in manufacturing as second-to-last in a list of potential fields (placing technology and energy at the top), and only 30% say they would encourage their children to pursue a career in manufacturing.[9]

Traditional education alone is not enough

For those who do decide to pursue an education in industrial manufacturing, their options aren't always up to par with employers' expectations. Investments in vocational education declined in the 2000s and were hit especially hard by the 2008 recession, which impeded the development of these programs and limited options for students. The programs are now bouncing back, but the skills and concepts learned in school become outdated and impractical quickly. This is especially true in industrial manufacturing, an industry that requires strong, hands-on experience with complicated tools like design software, machinery, and equipment.

[6] Emsi. In-Demand and Aging: A Look at Engineers and Engineering Technicians in the Workforce. Sept 2014.

[7] IndustryWeek. Tool and Dying: Auto Leaders, From Ford to FCA, Brainstorm on Saving the Shops that Sustain Them. April 2017.

[8] Deloitte, Manufacturing Institute. 2018 Deloitte and The Manufacturing Institute skills gap and future of work study. 2018.

[9] Reliable Plant. Just 30% of Americans see manufacturing as a career choice.

The urgency of closing the skills gap

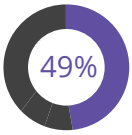
The idea of trying to fill millions of jobs over the course of several years sounds like a lofty, abstract problem. The reality is that the industrial manufacturing skills gap is already impacting manufacturing teams, large and small, across the country.

Recent reports show that approximately **8/10 manufacturing executives agree** that the skills and labor shortages are impacting their current ability to meet demand, increase productivity, and implement new technologies.[10] Plus, the time it takes to fill skilled positions is getting longer and longer — about 30% more time than in 2015.[11]

The average time (in days) to fill skilled roles in manufacturing in 2015 vs. 2018.

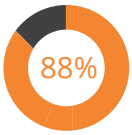
Source: 2018 Deloitte and Manufacturing Institute skills gap study.

It's clear that industrial manufacturing teams are already feeling the effects of the skills gap. But still, survey responses from the Tooling U-SME 2018 Manufacturing Workforce Report[12] show that managers are doing little to start closing the gap and upskill their workforce.



49% of respondents say their company has not begun assessing their manufacturing employees' current skills against skills they will require in the future

54% don't currently budget for employee development



88% say their company is below average when it comes to offering outside resources to upgrade the skill sets of employees

At the same time, 92% of manufacturing executives also say that upskilling the workforce is their primary challenge. So understanding the slow movement to address the skill gap might not be a question of what needs to be done, but rather, how to do it.

[10] Reliable Plant. U.S. Manufacturing Faces a 2-million Worker Shortage. 2018.

[11] Deloitte, Manufacturing Institute. 2018 Deloitte and The Manufacturing Institute skills gap and future of work study. 2018.

[12] Tooling U-SME. 2018 Manufacturing Workforce Report. 2018.

Closing In on the Skills Gap

Closing the manufacturing skills gap means figuring out how to upskill current and incoming employees. While this sounds like a difficult, time-consuming, and expensive endeavor, it doesn't have to be. Here are some impactful ways industrial manufacturing teams can start attracting more talent and future-proofing their team for Industry 4.0:

Apprenticeships

Apprenticeships sound like an archaic form of training, but in recent years these programs have made a tremendous resurgence. The **number of manufacturing apprenticeships has grown by 42% since 2013**, supported in part by the Department of Labor's American Apprenticeship Initiative, which contributed $175 million to these programs.[13]

Offering apprenticeships to manufacturing employees gives them the technical and practical experience they need in a hands-on setting. Apprenticeships not only widen the pool of potential employees, but they also help foster higher engagement with the organization.

Online learning platforms

Investing in eLearning is a fast, simple, and effective way to start immediately upskilling the manufacturing and engineering workforce. Whether used alone or as a supplemental tool in an apprenticeship program, an online learning platform can enable busy production and engineering teams to learn new skills quickly with minimal downtime and costs. In fact, **online learning can cost 75% less**[14] than traditional classroom training.

Online learning platforms also allow for easy, standardized employee onboarding and update training so that all employees are on the same page. After that, employees can learn at their own pace, advancing to specialized skills or revisiting core concepts as needed. Through the platform's reporting tools, managers get a clear view of how each individual employee is progressing, and they can determine which skills need the most focus. Some platforms offer **skills gap analysis** for an even closer view of a team's strengths and weaknesses.

Added bonus: using modern, digital learning platforms can be more attractive (and effective) to younger workers than classroom training.

> "Creative solutions to fill the talent gap include hiring people who are not necessarily prepared for a career in industrial equipment — indeed, who may have preferred a job in Silicon Valley or someplace attractive like that — but are technologically savvy and potentially a great asset for a manufacturer in transition."[15]

[13] Forbes. Addressing Manufacturing Worker Shortage, Apprentice Programs Expand Pool of Engineer Technicians. Feb 2019.

[14] SolidProfessor. SolidProfessor's Jump Start Training Budget Guide. Dec 2018.

[15] PwC. Industrial Manufacturing Trends 2018-19 & New strategies for IoT investment. 2018.

Which skills are industrial manufacturing teams learning online right now?

Engineering teams in the industrial equipment and machinery industry are training on these key skills and software, according to online learning platform data:

Source: SolidProfessor analysis

Hire with flexibility and look for soft skills

With the rise of the gig economy and millennials' tendency to switch roles every few years, another major source of potential labor can come from a more flexible approach to the hiring process. The industrial manufacturing workforce of the future might not look like it has historically. Instead, it could encompass more part-time and contract arrangements. It could also mean hiring people from more varied professional backgrounds, possibly with non-engineering degrees or entirely unrelated experience.

With this approach, it's important to hire for soft skills. Instead of looking for specific technical skills to fill a particular role, look for skills such as logic troubleshooting, spatial visualization, critical thinking, and most importantly, a willingness to learn. Hiring for these skills and then providing ongoing training in the role can help ensure these industrial manufacturing teams are robust and ready for the future.

Summary

For the industrial manufacturing industry to close the skills gap and fill 4.6 million jobs over the next several years, one thing is certain: the time to act is now. Industrial production and engineering teams that continue to follow the status quo will risk their competitiveness and lag in their adoption of new, innovative technologies. Exploring solutions including apprenticeships, online learning platforms, and flexible hiring processes today can help teams in the industrial manufacturing industry reach their full potential tomorrow.

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