

Meet the Robots:

What the New Generation of Artificial Intelligence Means
for the Manufacturing Workforce

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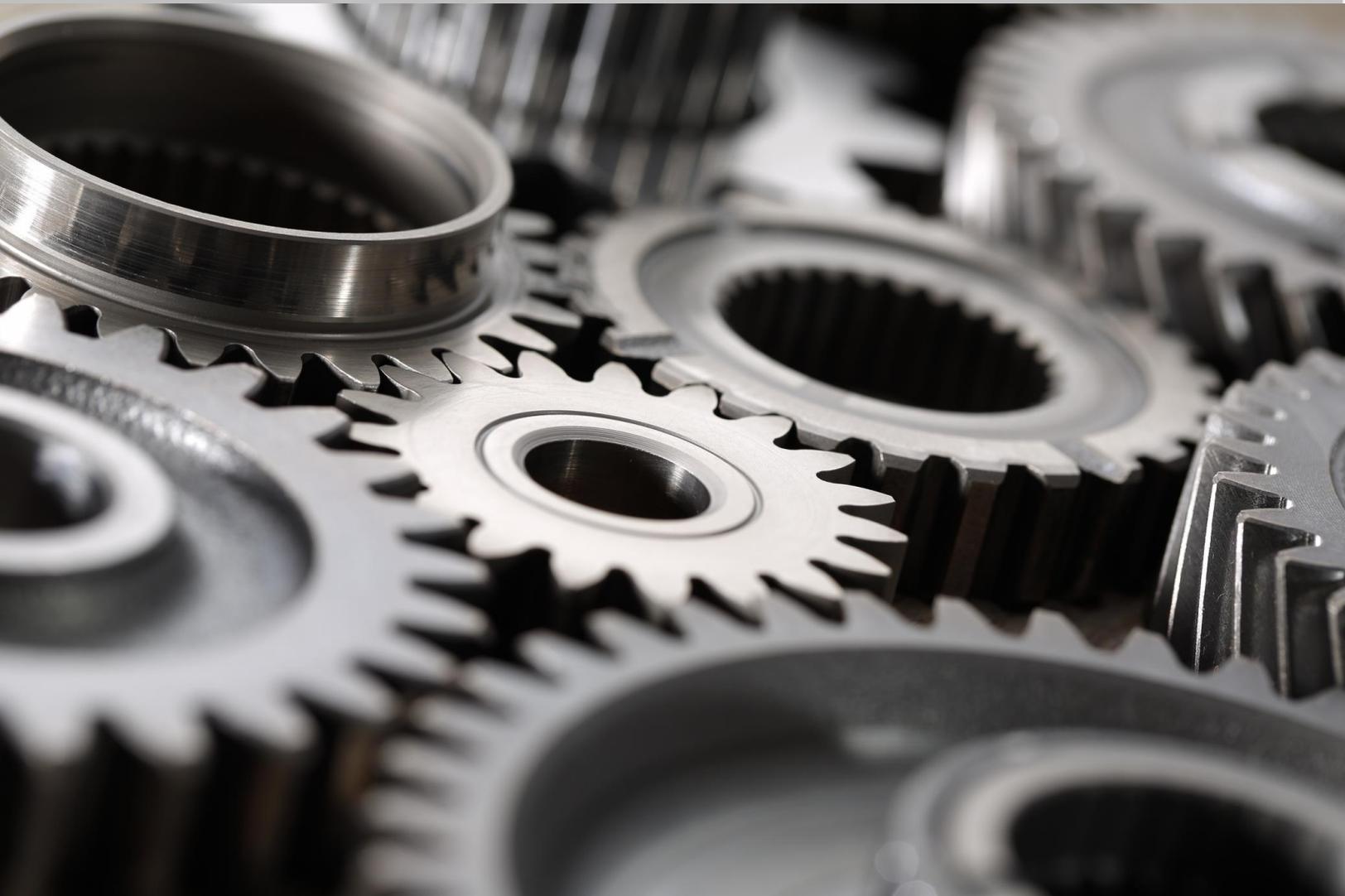
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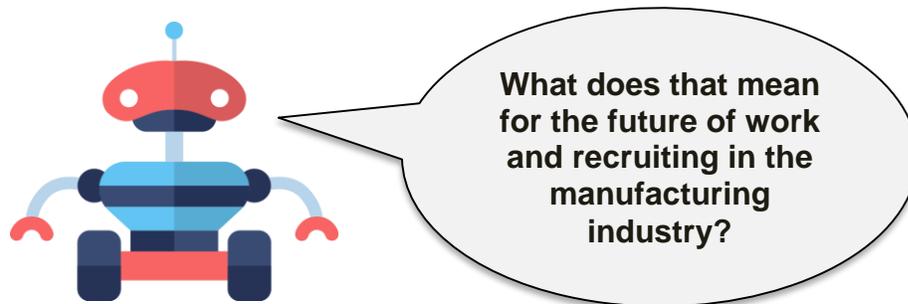
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In 1885, Karl Benz built the first gasoline-powered automobile. Just twenty years later, the Ford Motor Company began mass-producing the Model T. And today? We're on the brink of another revolution in the auto industry with the advent of self-driving cars. The gasoline engine changed manufacturing (and every other overlook industry) permanently. But when we study the history of the automobile, we often the effects it had on the people who did things the old way. What happened to all the carriage makers and blacksmiths and wagon drivers? Where did the people who made deliveries via horse-drawn cart find work when society began its century-long love affair with the automobile?

Today we're dealing with a different kind of industrial revolution: artificial intelligence. As robots and smart machines become more common on the factory floor, human workers worry about the fate of their jobs. It's a legitimate concern. Will robots make human employees obsolete in the manufacturing industry?

Every time industry makes a leap forward, we see a corresponding shift in the demands of the workforce. It happened at the start of the 20th century and it's happening again in the 21st. The question is:



Move Over Rosie: AI Is Coming to an Industrial Plant Near You

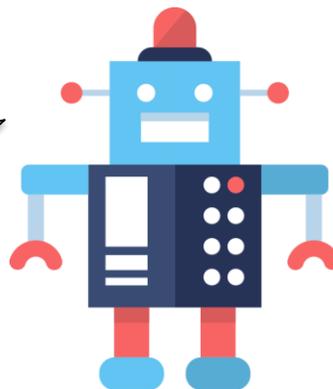
Remember Rosie the robotic housekeeper from the 1960's futuristic cartoon, *The Jetsons*? Rosie could do anything a human could do including cook, clean, carry on a conversation, and fall in love. But today's robots aren't just pseudo-humans. They're doing more than their human counterparts can, and that's one of the reasons they have made deep inroads into the manufacturing sector. Using cognitive technologies based on big data, intelligent industrial robots can increase the productivity and accuracy of manufacturing projects, and they can carry out complex tasks that previously had to be done by humans.

How exactly have robotics and artificial intelligence (AI) improved the manufacturing industry?

- **Machine Learning**—Machine learning, or the ability of a computer to “learn” by making predictions and receiving feedback, has created smart machines that can make small adjustments early in a process to deliver the best possible results. Using data-based assessments, smart machines can improve production capacity, consumption rates, factory management, maintenance procedures, and much more.
- **Predictive Analytics**—Predictive analytics is the science of using data to predict specific outcomes. Machines implement this kind of analysis in many different settings, from safety and accident prevention to overall equipment effectiveness.
- **Voice and Image Recognition**—New capabilities in voice and image recognition help machines learn complex tasks quickly. Even tasks that formerly required input from humans can be programmed into machines, eliminating the potential for human error.
- **Internet of Things (IoT)**—As machines and their various components connect online, companies can implement efficiency measures such as smart energy, quality control, waste management, smart security, and productivity enhancement.
- **Virtual Reality**—Virtual reality can be used to troubleshoot problems in a secure environment. It also allows engineers in different locations to work on a project together without time lags or travel expenses.

Some of these capabilities are still in the development stage, which means we haven’t yet seen the full extent of the impact they will have on the manufacturing industry.

But already, companies can use intelligent robotics (like me) for many applications, such as:



- **Automated Manufacturing Processes**—Automated processes reduce error and increase both productivity and safety for complex tasks. Companies like Flex, a leading manufacturing and engineering firm, have already [automated a significant portion of their processes](#), and we can expect even more automation in the future.
- **Cloud-Based Production and Innovation**—Using cloud-based data management and analysis, companies can manage production quotas, assess and implement safety measures, create predictive maintenance models, respond to customer feedback, and much more. The data comes from smart sensors integrated into machines so that companies can constantly monitor output and performance.
- **Predict Danger and Prevent Accidents**—Smart machines can identify glitches or problems in a system more effectively than human operators can. If there's a potential safety hazard, AI machines can neutralize it before someone gets hurt.
- **Preventive Maintenance and Overall Equipment Effectiveness**—Sensor data can monitor equipment parts and function, reducing down time and identifying bottlenecks in production.
- **Boost Production Yields**—Smart machines can analyze customer feedback, supplier availability, equipment, and staffing needs to increase overall production.



Of course, these are just a few of the ways intelligent machines and smart robotics can be applied to the manufacturing industry. As technology continues to evolve, so will the possible applications.

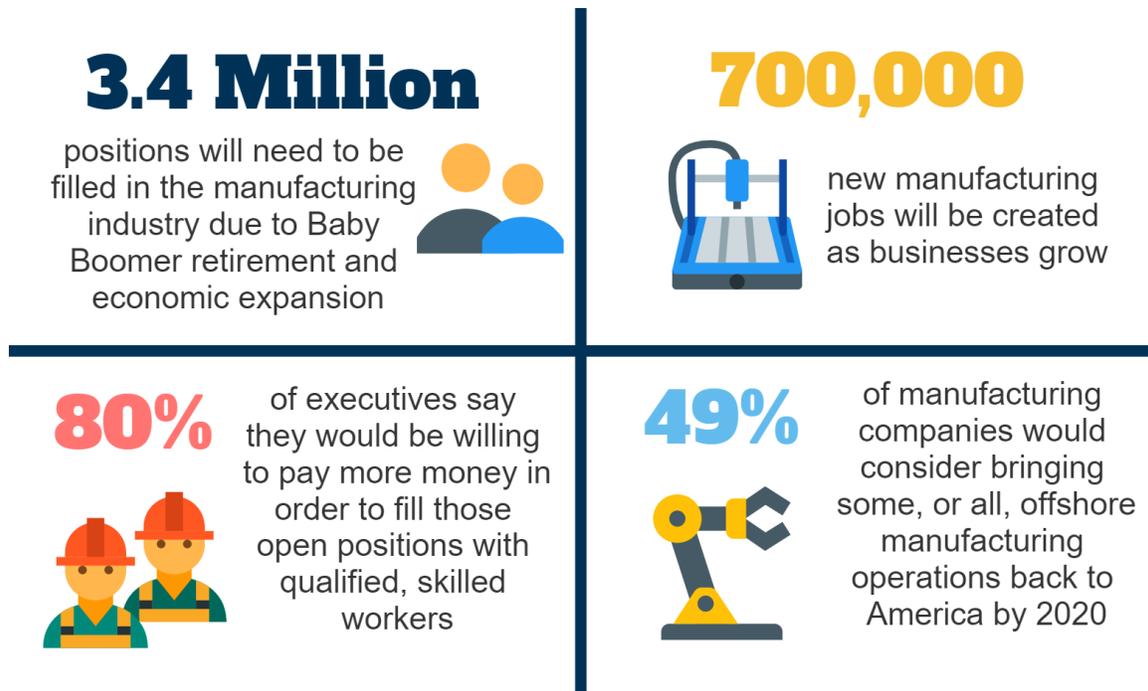
And that has a lot of people worried about the future of jobs in the manufacturing sector.

What Does All the Buzz About AI and Robotics Mean for the Workforce?

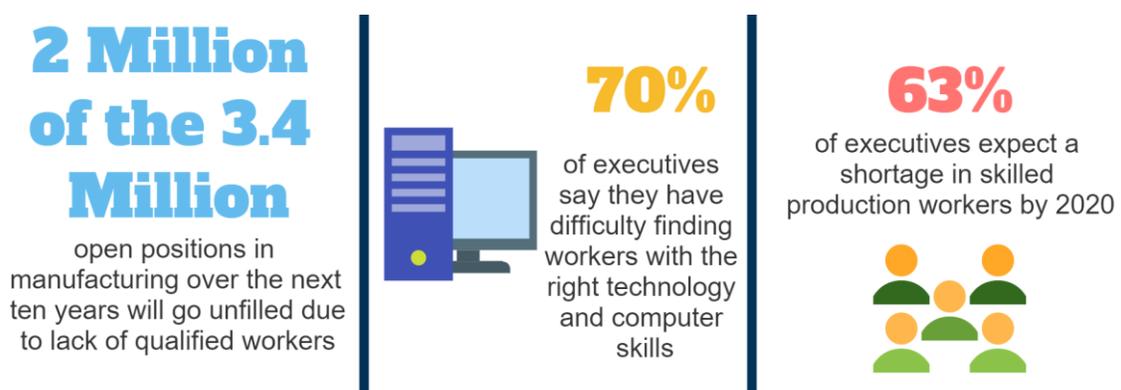
According to research analyst, Nandini Natarajan, predictive analytics and machine learning will become [manufacturing's most desirable technologies](#) by 2020. And that's just the beginning. By 2023, the global industrial robotics market will grow to exceed \$70 billion—more than double its current value.

If you listen to some pundits, the outlook for manufacturing jobs in America is bleak. According to one report, 85% of the 5.6 million jobs lost between 2000 and 2010 were [casualties of machine learning](#). Fretting about robots taking jobs from human workers has become par for the course.

But is the job forecast for manufacturing really all that grim? Let's take a look at some predictions from [The Manufacturing Institute's 2015 report](#). By the year 2025:



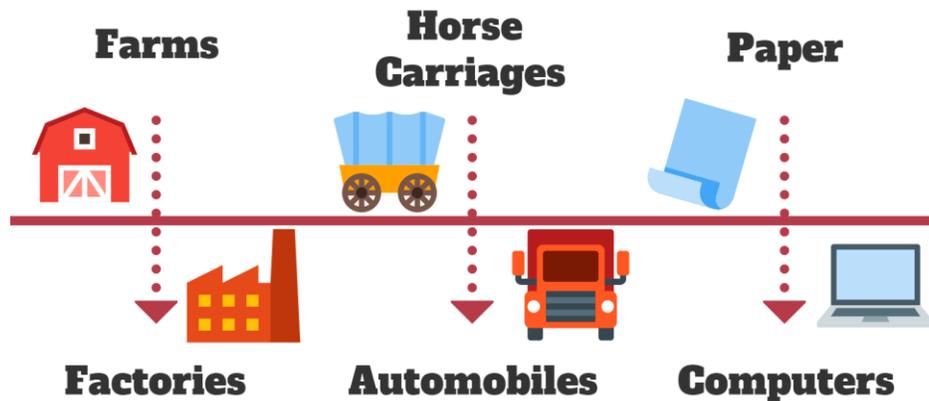
So what's the problem? Why is everyone so worried about the future of jobs in manufacturing? Two words: **skills gap**. Let's look at a few more numbers from the report:



The bottom line is that as machines and intelligent robots take over many of the physical tasks formerly carried out by human workers, manufacturing jobs will [shift from the factory floor to the computer](#).

What Jobs Are in Highest Demand?

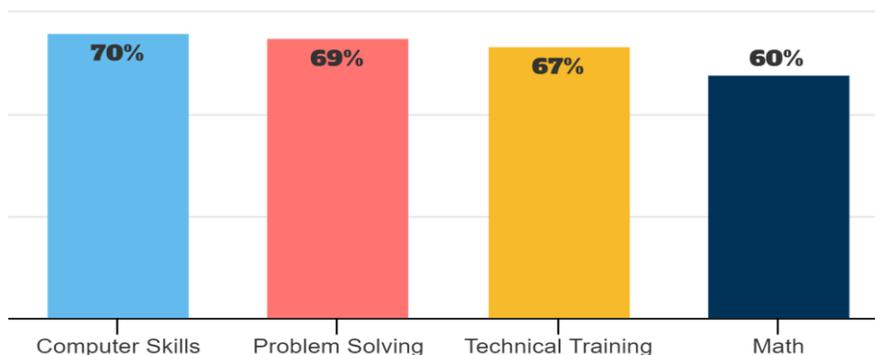
Every time the world has experienced a breakthrough in technology, workforce demands have changed. From farms to factories, from horse carriages to automobiles, and from paper to computers, jobs have evolved to meet the needs of new opportunities. As the economy demanded fewer carriage drivers and cart makers, it also created new opportunities for automobile manufacturers and gasoline stations.



That's the same kind of change we're seeing in today's job market. The shift toward robotics and smart machines will ultimately result in lower costs, higher profits, and more jobs in the manufacturing industry. Forrester Research estimates [that automation and artificial intelligence jobs will account for 10% of the workforce](#) over the next ten years. That's nearly 15 million new positions.

But the report predicts job losses as well. As fewer welders, solderers, and cutters are needed, manufacturing executives expect to hire more people with the following skills:

Manufacturing Skills Shortage



Source: [The Manufacturing Institute and Deloitte 2015 Report](#)

Tomorrow’s manufacturing job descriptions will include managing operations, programming machines, and maintaining robotic technology. As machines complement human workers, robots will increase output and perform tasks that would be unsafe or impossible for human workers. To keep those machines running, manufacturing companies will need workers who can:

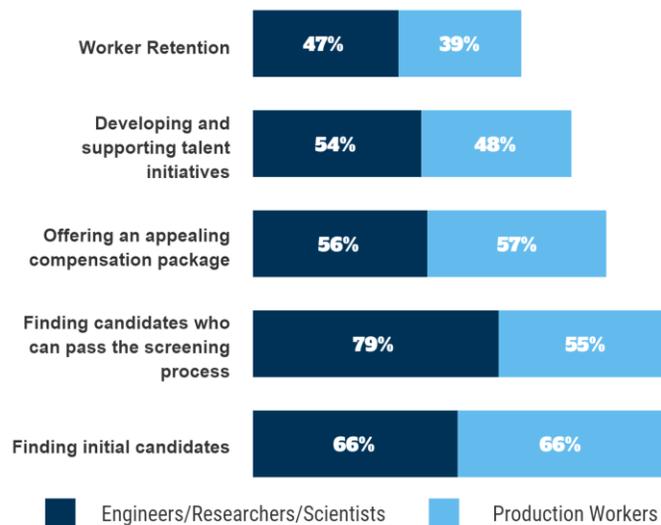
- Oversee and maintain robotic technologies
- Make decisions about robotics production in real time
- Apply math skills to spatial problem solving
- Manage technical operations
- Develop 3D modeling
- Manage data systems
- Interpret data analysis
- Contribute to design changes

The problem is that workers with these skills aren’t always easy to find.

Recruiting Challenges in Manufacturing

As we saw above, manufacturing executives expect a need for more workers with computer and technology skills in the future. But that presents challenges in an economy where STEM (science, technology, engineering, and math) qualifications are in short supply. The reasons for the skills shortage vary and include retiring Baby Boomers, a lack of emphasis on STEM skills in the school system, the introduction of automation and intelligent robotics into manufacturing processes, and an aversion to manufacturing jobs on the part of upcoming generations of workers.

Whatever the underlying reasons, it’s getting tougher to find qualified workers who can fill open positions. And it’s not a one-size-fits-all problem. [Executives report](#) different challenges for different kinds of positions:



Source: [The Manufacturing Institute and Deloitte 2015 Report](#)

As demand grows, supply has stagnated. And that problem will only get worse with time if manufacturers and recruiters can’t reverse the trend.

Keys to Recruiting Tomorrow's Manufacturing Workforce

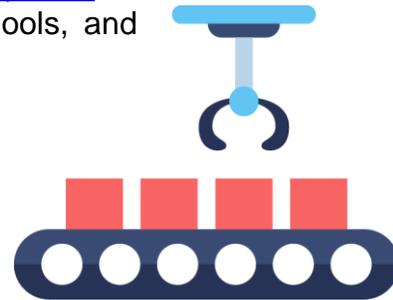
Closing the skills gap in manufacturing will take a concerted effort on the part of the industry. Because the challenges are varied, there is no single solution that can guarantee the desired outcome. However, [targeted recruitment strategies and a holistic talent management approach](#) can work together to build a stronger manufacturing workforce.

Here are 6 keys to attracting, hiring, and retaining skilled talent for the manufacturing industry:

1. Use a variety of sources to find the right talent.

Staffing agencies are no longer the only—or even the best—source of qualified talent for manufacturing positions. Companies can and should cast a wide net to find and recruit talent by availing themselves of resources like:

- [Recruitment process outsourcing \(RPO\) firms](#)
- Partnerships with tech programs, schools, and community colleges
- [Company recruitment pages](#)
- [Positive employer branding](#)
- Job boards
- [Social media recruitment marketing](#)
- Apprenticeship programs
- Referral programs and word of mouth



Don't stay in the same old rut when it comes to talent sourcing. [Younger workers do much of their job searching online via company job pages, job boards, and social media.](#) If you want to recruit them, you have to go where they are.

2. Review your compensation strategy.

The average manufacturing worker's salary is [20% higher](#) than the salary of average workers in other industries. To meet hiring demands, many companies are willing to offer skilled workers even higher salaries. But is it enough? Higher compensation is certainly a good (and necessary) place to start, but it may not be enough by itself to overcome talent shortages. Consider looking at other incentives like benefits, flexible work hours, and performance-based incentives in addition to stronger compensation packages.

3. Tackle the perception problem.

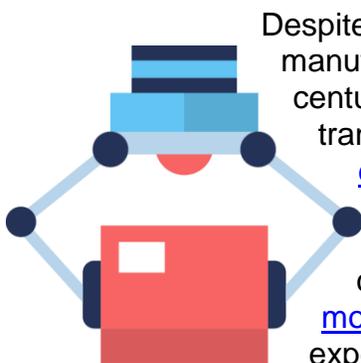
[More than half of American teenagers](#) express no interest in pursuing a job in manufacturing. One of the big reasons is that they think manufacturing involves dirty, low-skill jobs with little opportunity for growth. And it's not just teens who think manufacturing is a less than desirable career choice. In [one survey](#), Generation Y workers (ages 19 – 33) said manufacturing was on the bottom of the list for career preferences.

Clearly, manufacturing is facing a serious perception problem. The more familiar people are with the industry and its opportunities, the more likely they are to view it positively. That means companies can work to change perceptions by participating in community events, ambassador programs, camps, and other efforts to promote manufacturing careers.

4. Partner with the community to expand the talent pool.

Community partnerships with local schools and colleges can go a long way toward building a reliable talent pipeline. By investing in early STEM education, apprenticeships, and workforce programs, manufacturing companies can pave the way for students to receive the training and certification they need to succeed in the industry.

5. Use smart technology in the hiring department, too.



Despite advanced robotics and AI in the factory, many manufacturing companies are still stuck in the twentieth century when it comes to hiring. But smart technologies can transform recruitment efforts too. [Predictive analytics](#), [deep data analysis](#), [applicant sourcing technology](#), and [talent attraction automation](#) can all help recruiters find and engage qualified talent more effectively. These tools can also [help recruiters screen prospective candidates more efficiently](#) so they can make better decisions based on experience, background, and performance.

6. Look within.

Investing in internal training and development is a strategy often overlooked by manufacturers when it comes to building a technologically savvy workforce, but it holds excellent potential for return on the investment. Companies can train current employees in the specific skills they need as part of an integrated training strategy that includes opportunities for certification and professional development. It's also an excellent way to build loyalty in your team as you boost both performance and retention.

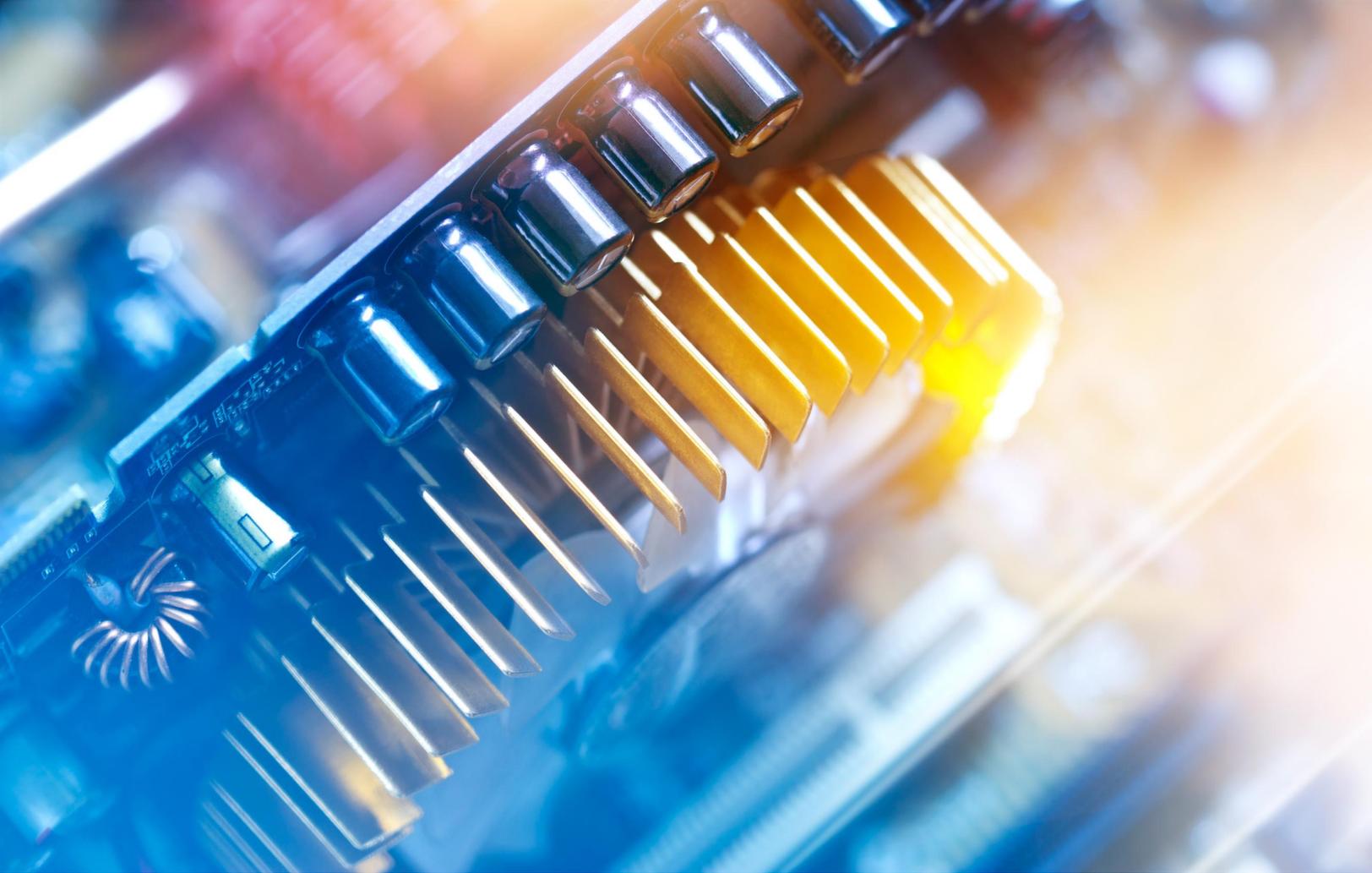
As Job Requirements Evolve, the Workforce Will Too

Remember our carriage makers and wagon drivers from the pre-automobile workforce? What *did* happen to them when their skills were no longer required? The simple answer is: they evolved. The creative ingenuity and mechanical expertise that once served a horse-and-cart society developed new skills that built the automobile empire we have today.

We're in the middle of a similar industrial revolution today. As artificial intelligence changes the manufacturing industry for the better by increasing production and reducing costs, human workers will benefit from higher-paying jobs, increased safety, and more meaningful work.

Are you ready to take on the challenge?





About Hire Velocity

At Hire Velocity, we are passionate about designing talent strategies that transform organizations, and make the impossible possible for our clients. By combining high quality delivery teams with the most advanced recruiting and social media tools, we utilize two of our greatest assets—our talent and technology – to discover, measure, maximize, and deliver results.

