



UNIVERSAL ROBOTS

CRISIS

I N M A N U F A C T U R I N G

Leveraging New Technologies
to Address the Labor Shortage

Right now businesses and manufacturers are witnessing a fourth Industrial Revolution, defined by the union of human, computer, and machine technologies. As workers and business owners enter this new environment, new challenges in the workplace develop. The US recognized a significant challenge in 2018 – for the first time in history, the US Bureau of Labor Statistics (BLS) reported more job openings than people available to fill them. While exceptionally low unemployment may seem like a boon to the country, this creates financial headwinds for individual companies – especially those within the manufacturing sector – as well as for the US economy overall.

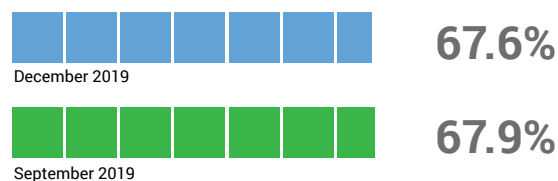
Manufacturing Jobs by the Numbers

Several statistical trends offer support and context to these BLS findings. In late December, 2019, the National Association of Manufacturers (NAM) issued its latest Outlook Survey, which confirmed, for the ninth consecutive quarter, that finding skilled workers remains one of the top challenges for manufacturing executives today. The Society of Manufacturing Engineers reports 89% of manufacturers are having difficulty finding skilled workers. The situation does not appear ready to improve any time soon. The most recent skills gap study from Deloitte and the Manufacturing Institute – NAM’s social-impact arm – projects that more than half of the 4.6 million manufacturing jobs created over the

next decade will go unfilled. The NAM study attributed this projection to three factors: the impending retirement age for baby boomers, widespread misperceptions of manufacturing jobs among younger workers, and a shift in needed skill sets due to the introduction of advanced technologies.

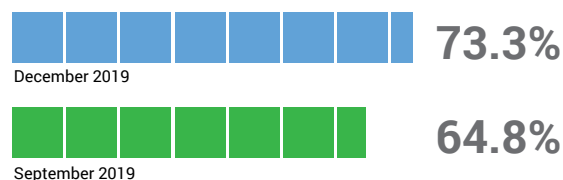
NAM Manufacturers Outlook Survey (Dec 2019)

Percentage of Respondents Positive About Their Own Company's Outlook

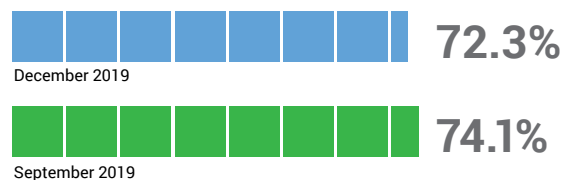


Breakdown of Responders

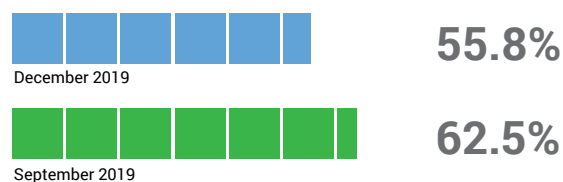
Small Manufacturers



Medium-Sized Manufacturers

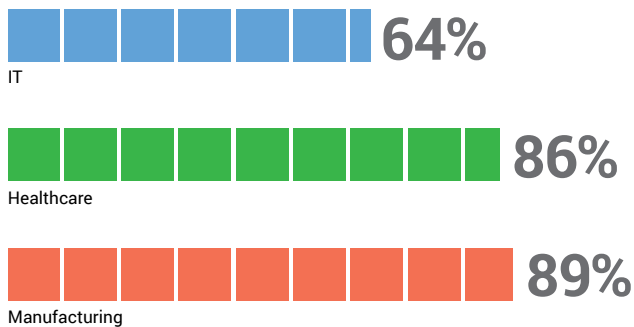


Large Manufacturers



Source: "NAM Manufacturers Outlook Survey, Fourth Quarter 2019"

89% of Manufacturers Have Difficulty Finding Skilled Work



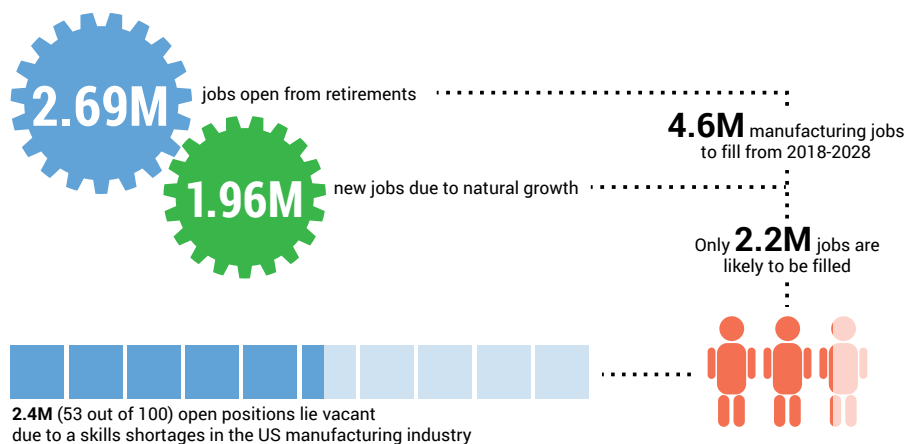
Source: "Mission Critical: The Manufacturing Skills Gap and Workforce Opportunities," SME

The BLS reported in December, 2019, that 25% of the nation's manufacturing workforce are over the age of 55. This means that, just to fill retirement vacancies, 1,000 person manufacturing operations will have to hire 250 workers to maintain current levels of production.

Americans, meanwhile, do not appear interested in filling the gap from retiring boomers with Millennials and Gen-Z. The most recent research by Deloitte and the Manufacturing Institute found that while 83% of the US public regarded manufacturing as important to the economy, fewer than three in ten Americans would encourage their children to pursue manufacturing careers.

So far, the solutions pursued by manufacturers are inadequate and expensive. Asked how they were addressing the skills shortage, executives' responses in the Deloitte survey ranged from assigning more overtime (70.3%), to relying more on temporary staffing services (57.7%), and encouraging possible retirees to stay longer in their roles (30.7%) – all strategies that adversely impact the bottom line. An additional 28.8% reported they had to turn away new business or had lost revenue opportunities because of workforce constraints. The most recent study from Accenture conducted for the Manufacturing Institute measures the outcome of this labor shortage: average corporate losses in the US are estimated at 11% of annual earnings due to unfilled positions, or losses of \$3,000 per year per existing worker.

The skills gap may leave an estimated 2.4 million positions unfilled between 2018 and 2028



*Calculated on the basis of 52.7% of the skilled manufacturing positions that are unfilled (per the 2018 survey)
 **Retirement age of 66

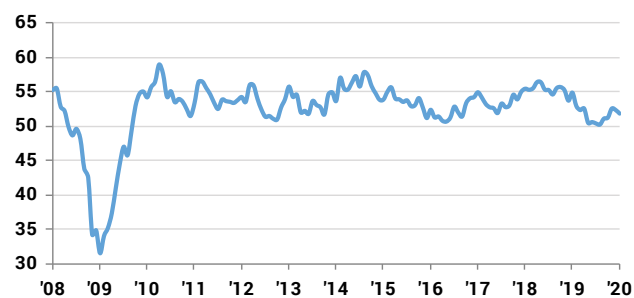
Source: 2018 Skills Gap and Future of Work Study, Deloitte and the Manufacturing Institute.

Leveraging the current workforce in the same modes of production will lessen its already minimal efficacy into the future. The newest BLS “fill times” statistics show that manufacturing positions hit a new all-time record high of 30 days on average before being filled. In the context of shifting skill sets for manufacturing jobs, Deloitte’s skills gap study recorded fill times for skilled positions jumping from a 70-day average in 2015 to a 93-day average in 2018. After 10 years of solid growth, every type of manufacturing operation, from Fortune 100 companies to start-ups, reports that labor tightness is constraining growth. Purchasing Manager Indices (PMI) from IHS Markit, which signal the pace and direction of activity in

manufacturing, have been rapidly decreasing since the beginning of 2018 to the two lowest scores of the decade in May and June of 2019, reflecting a standstill in the growth of US manufacturing. The new decade starts with a US Manufacturing PMI of 51.9, a three-month low.

U.S. Manufacturing Purchasing Managers’ Index™ (PMI™)

>50 = improvement since previous month

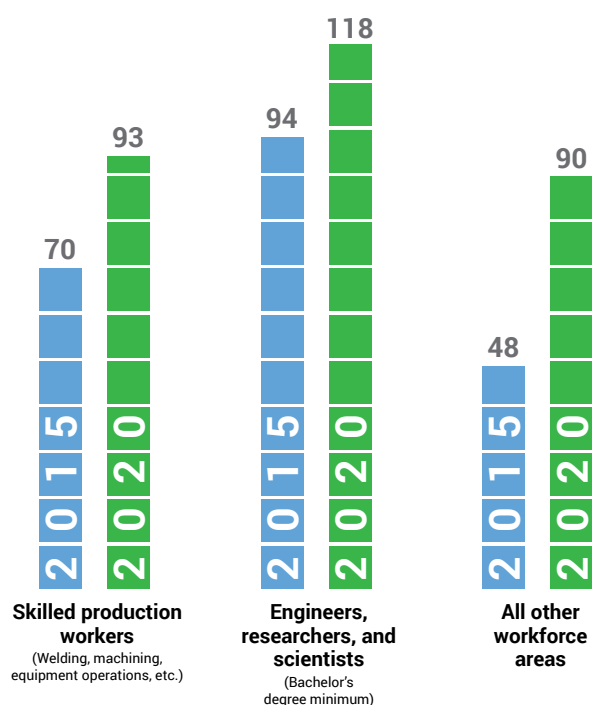


Purchasing Managers’ Index™ (PMI™) data are derived from surveys of senior executives at private sector companies and indicates the overall health of an economy.

Source: IHS Markit.

The average time to fill an open job position is on the rise

Number of days to fill a job position, by categories, 2015 and 2018



Source: 2018 Deloitte and Manufacturing Institute skills gap study.

Manufacturers considering or relying on old conceptions of industrial robotics must face the several shortcomings of this strategy as well. While early robotics from the 1970s onward improved productivity on a mass scale, the technology was expensive and time-consuming to purchase and install, required safety systems that consumed considerable factory floor space, and required engineering staff to keep it operating. In the face of corporate losses and a booked labor force, only the largest manufacturers can afford to free up the capital to invest in or maintain this costly, bulky, dangerous, and slow-paced solution.

Industry Today

The unifying reason these two “more of the same” approaches will fail to ease conditions for workers and company owners is because they both focus narrowly on the labor and skills gap as problems. Instead, companies poised to succeed in the immediate future need to embrace these growing pains coming with the Fourth Industrial Revolution as opportunities for new technologies. Deloitte shares in its 2019 Global Human Capital Trends report that organizations of all sizes believe it is urgent to reinvent work and work architecture to meet the upcoming challenges in manufacturing. Researchers assert “there are two aspects of the reinvention that must remain constant: (1) it must involve technology in some way – there is no path to reinvention without it and (2) it must be a bold enough change to meet the challenges that the social enterprise presents.”

Computerization may have defined the last workplace revolution, but what distinguishes the technologies of industry today is that they blur the lines between human, computer, and machine work. Collaborative robots (cobots) realized by Universal Robots is a solution defined by this contemporary environment. An ideal tool for modern manufacturers, cobots combine the physical abilities and digital control systems of a robot with the size, flexibility, and power necessary to safely and effectively collaborate with people.

Cobots: Proven Solutions for Modern Manufacturing

Cobots offer the same benefits as traditional robotics: taking over dirty, dangerous, or repetitive jobs; improving product quality; and enhancing productivity and yield. In exchange for lower payload capacities compared to traditional robots, cobots offer manufacturers several new benefits that traditional robotics cannot.

First and foremost, cobots are designed to work right next to people without a safety fence in between. Thanks to their unique design, most cobots do not require safety cages or disruptive redesigns of the plant floor. Many designs can be deployed 50% faster than traditional robots and often impose an installation cost lower than the annual new employee wage.


Unlike traditional robots that require engineer-level programming, cobots are designed to make programming simple through human-machine interfaces (HMI) familiar to anyone who has used a smartphone.

With advances in artificial intelligence algorithms, cobots are also capable of learning on the job. Often, a worker can reprogram a cobot simply by putting its arm through the desired motions; the cobot remembers the instruction and repeats it independently, without the need for a new code. By eliminating the need for a formal education in programming or robotics, such interfaces and capabilities make the skills gap and learning curve for using cobots diminishingly small. This also greatly

reduces the time, effort, and cost associated with retasking a cobot for temporary tasks or burst production during busy seasons.

While industrial robot work cells often require considerable customization, the flexibility of a cobot translates to faster return on investment. By speeding deployment with minimal disruption to a factory layout, and by enabling minimally trained workers to safely program and use the technology to increase productivity and improve quality, cobots' payback is routinely measured in weeks or months (see Universal Robots case study library for more details). This fast ROI is not just a function of cobot technology's lower capital cost versus traditional industrial robots.

It is enabled by collaborative automation's ability to multiply the value of an enterprise's human assets, freeing workers to tackle higher productivity processes and acquire new skills for a modern manufacturing age.

Solving a crisis of labor requires a reinvention of work and the workplace that uses bold changes in technology. In addition to cutting costs and streamlining production, leveraging collaborative automation has the opportunity to improve the experience of work in manufacturing and enhance value for customers. The human - machine pairing that cobots enable is the critical step toward delivering these values. 

Let Universal Robots introduce you to the new paradigm in safe, flexible, and easy-to-deploy factory automation, and demonstrate how collaborative robots can help you multiply workforce productivity, increase customer value, and beat the labor shortage.

Contact us at us.marketing@universal-robots.com to identify projects where cobots can deliver value in under 12 months. In most cases, our technology can be implemented and operating within 30 days of submission of your purchase order.

Visit www.universal-robots.com for more information.