VISUAL COMPONENTS

Tackling the manufacturing skills shortage with simulation and robot offline programming

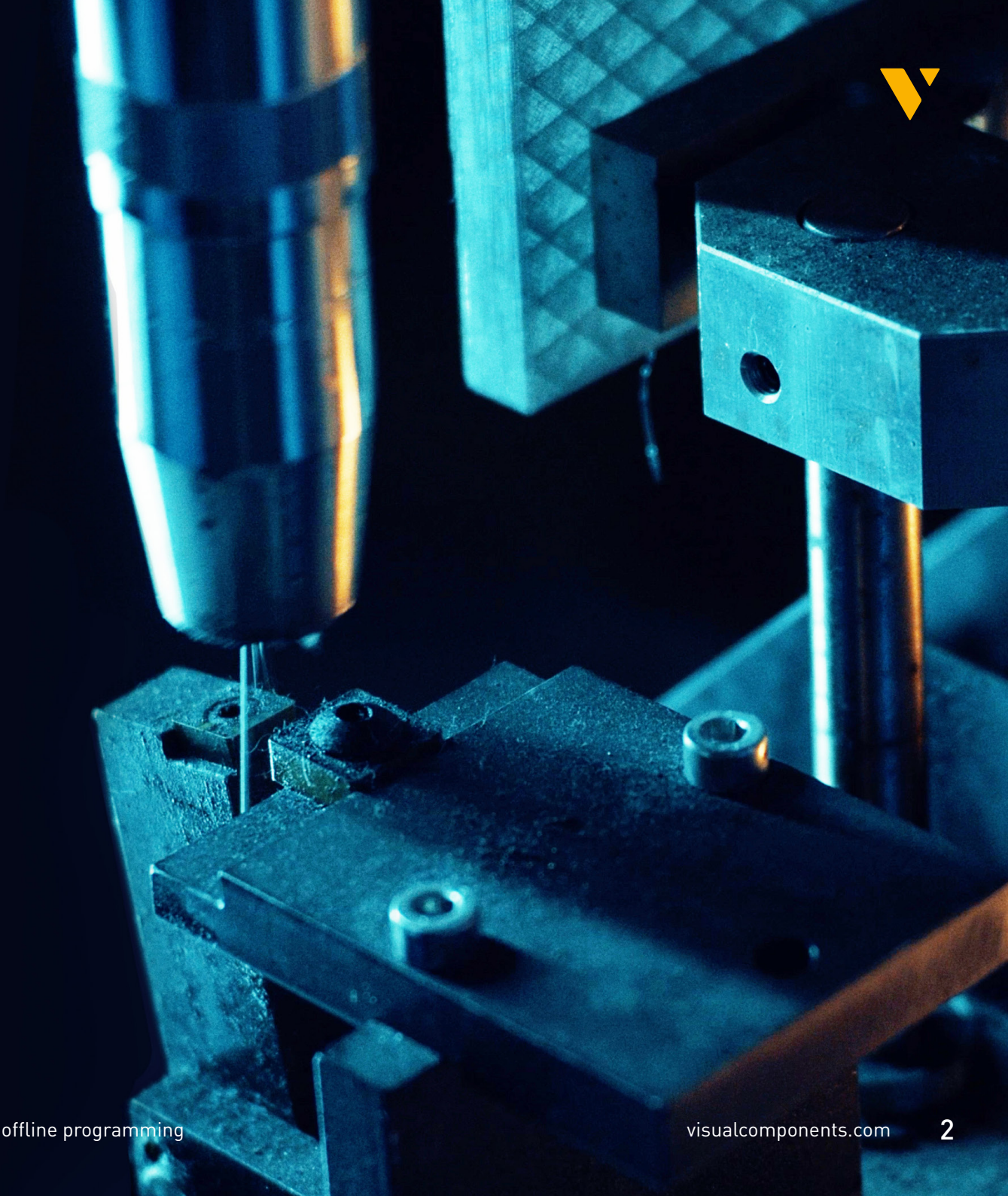
June 2024

The manufacturing industry is really feeling the pinch from the skills shortage.

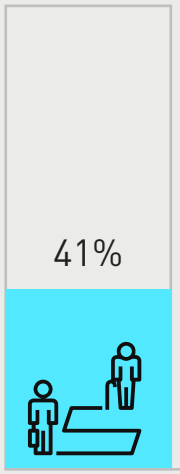
The pandemic sped up the retirement of the aging workforce, and now **78%** of companies are worried about this trend, according to The Manufacturing Institute. With **75%** of employers struggling to fill roles, manufacturers face potential drops in revenue, competitiveness, and reputation if they don't find solutions soon.

We at Visual Components checked in with over 300 manufacturing decision-makers in the UK, US, and Germany to get the lowdown on the impact and solutions for the skills shortage.

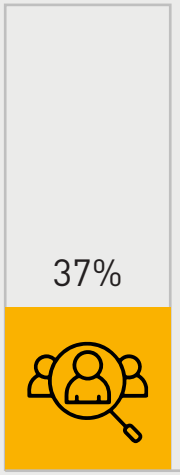
Here is what we discovered...



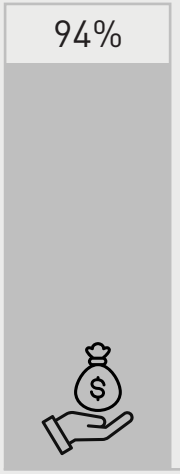
The scale of the exodus



A lot of professionals are planning to leave the sector. Nearly one-in-six decision-makers (16%) expect at least **41%** of their workforce to leave in the next five years.



However, only a third (**37%**) consistently hire new talent to replace those leaving, with even lower rates in the UK (34%) and Germany (32%). Many manufacturers don't partner with educational institutions to build a talent pipeline, making the skills gap even worse.



To attract in-demand talent, **94%** have upped salaries, but this approach leads to higher costs.

Besides financial incentives, some manufacturers are setting up mentorship programs to pass knowledge from experienced workers to newer employees. However, this strategy faces challenges, such as the reluctance of retiring employees to extend their tenure and the time needed to train new hires adequately. Companies need to balance immediate needs with long-term strategies to build a sustainable workforce.

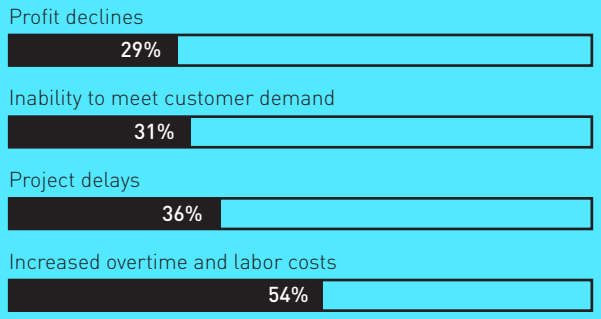
With the labour shortage persisting and requiring manufacturers to take drastic action, what impact is it having on organisations in the industry?

The consequences of the labour shortage

The skills shortage is hitting productivity and output for nearly all businesses (98%).

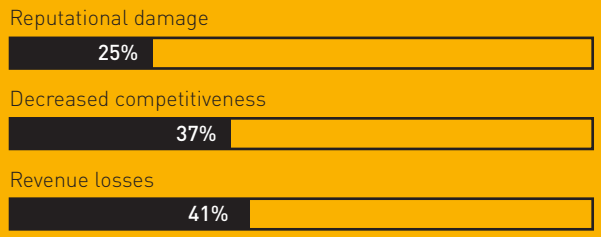
Short-term consequences

Short-term consequences include increased overtime and labor costs (54%), project delays (36%), inability to meet customer demand (31%), and profit declines (29%).



Long-term effects

Long-term effects are even more serious, with revenue losses (41%), decreased competitiveness (37%), and reputational damage (25%). Shifting customer demands and sustainability concerns add to the challenges manufacturers face.



The labor shortage impacts more than just immediate production capabilities. It affects companies' ability to innovate and respond to market changes.

For example, the lack of skilled workers can delay the implementation of new technologies and processes that could otherwise enhance efficiency and productivity. This delay in technological adoption can leave companies at a competitive disadvantage, particularly in a global market where rapid adaptation is crucial.

Moreover, the inability to meet customer demand consistently can damage relationships with clients and lead to lost business opportunities. In today's market, where customer loyalty is hard-won and easily lost, maintaining a reliable supply chain and meeting delivery commitments is essential for retaining business.

Addressing the shortfall

On the bright side, **64%** of organizations are taking steps to prevent future shortages, with **87%** prioritizing employee upskilling. However, this is a drop from last year's 100%. A reactive approach is still common, especially in Germany **(31%)**. Many businesses lack the necessary tools to reskill and retrain employees, with two-thirds **(66%)** feeling ill-equipped. Only **29%** have a solution in place to retain expertise, down from **47%** last year.

To tackle the skills gap effectively, companies need a multi-faceted approach that includes investment in technology, partnerships with educational institutions, and comprehensive training programs. For instance, simulation software and robot offline programming (OLP) are powerful tools that can significantly cut down the time and resources needed for training new employees. By creating a virtual environment where workers can learn and practice skills, these technologies help reduce the risks and costs associated with traditional training methods.

Partnerships with schools and universities are also crucial. These collaborations can help align educational programs with industry needs, ensuring that graduates possess the relevant skills required by employers. Additionally, offering internships and apprenticeships can provide students with hands-on experience, making them job-ready upon graduation.

Building the skills of current staff

With limited opportunities to hire externally, manufacturers need to focus on upskilling current employees.

Easier

Physical training in a live environment is popular **(70%)**, especially in the US **(73%)**. However, simulation software **(48%)** and robot offline programming (OLP) **(30%)** are underutilized. Simulation software lets staff design, analyze, and validate manufacturing layouts in a risk-free digital environment, reducing design time from days to hours. OLP enables staff to deploy various robot brands for different processes, creating a highly accurate digital copy of a robot's work cell for testing before real-world deployment.

Faster

Simulation software speeds up the learning process and allows for continuous improvement. Employees can experiment with different scenarios and solutions without disrupting actual production. This iterative process fosters innovation and helps identify the most efficient methods for manufacturing tasks.

Smarter

OLP offers another layer of efficiency by enabling concurrent programming and deployment. Instead of waiting for one task to complete before starting another, workers can program and test multiple robots simultaneously. This capability is especially valuable in high-mix, low-volume production environments where flexibility and quick turnaround times are essential.

Together

Moreover, digital tools support remote work and collaboration. In a post-pandemic world where hybrid work models are becoming the norm, having the ability to program and monitor robots from anywhere enhances operational resilience. It also opens up opportunities to tap into a broader talent pool, as geographical constraints become less of a barrier.

Empowering employees in the sector

The skills shortage, made worse by an aging workforce, needs proactive measures. Our research shows the urgent need for manufacturers to upskill their current workforce and attract new talent. While increasing salaries has been a common response, it's not sustainable long-term. Investing in technologies like simulation software and OLP can help build employee capabilities and streamline operations. These tools provide safe and efficient training, reducing the risks and costs associated with physical training. By adopting this approach, manufacturers can mitigate the skills shortage, maintain productivity, and ensure long-term viability.

One of the key benefits of simulation software and OLP is their ability to democratize access to advanced manufacturing techniques. These tools are user-friendly, allowing employees with varying levels of experience to engage with complex processes. This inclusivity not only enhances the skills of the current workforce but also makes the industry more attractive to potential new hires who may be intimidated by traditional manufacturing environments.

Furthermore, these technologies support sustainability goals by reducing waste and optimizing resource use. For example, digital twins—virtual replicas of physical systems—allow for detailed analysis and optimization before any physical changes are made. This capability reduces the need for costly and time-consuming trial-and-error approaches on the factory floor.

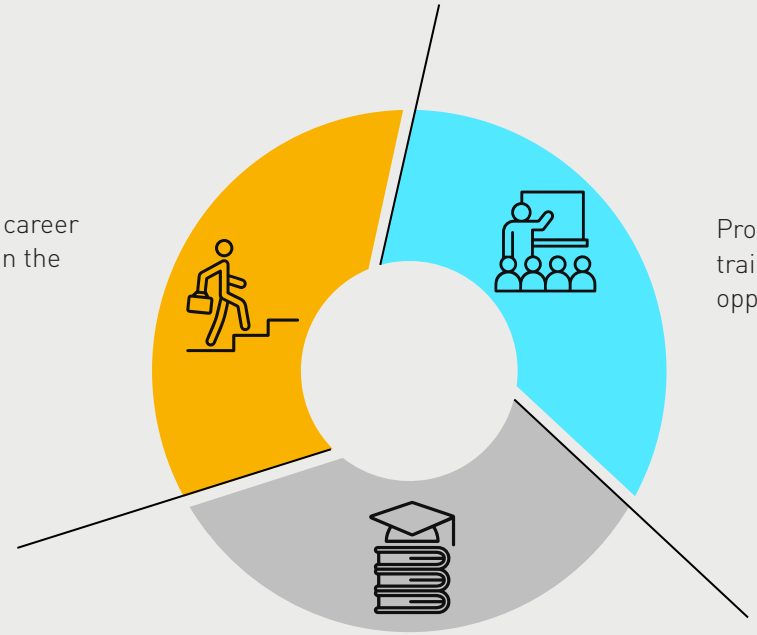
The integration of simulation software and OLP into manufacturing processes also fosters a culture of continuous learning and improvement. As employees become more proficient with these tools, they can take on more complex tasks and contribute to process innovation. This empowerment boosts morale and job satisfaction, which are critical factors in retaining talent.

Key benefits of simulation software and OLP

- Democratized access to advanced manufacturing techniques
- Attracting new talent to the industry
- Sustainability
- Culture of continuous learning and improvement

Long-term strategies for workforce development

To address the skills shortage sustainably, manufacturers must look beyond immediate fixes and develop long-term workforce development strategies. This includes:



Career pathways help employees understand the progression opportunities available to them, motivating them to stay with the company and develop their skills. Clear and achievable career goals, coupled with the necessary support to reach them, can significantly reduce turnover rates.

Ongoing training and development opportunities are also essential. As technology continues to evolve, so too must the skills of the workforce. Offering regular training sessions, access to online learning platforms, and opportunities for professional development ensures that employees remain competent and confident in their roles.

Fostering a culture of continuous learning involves encouraging curiosity and experimentation. Employees should feel empowered to explore new ideas and approaches without fear of failure. This culture not only enhances individual growth but also drives organizational innovation and adaptability.

Conclusion

The manufacturing skills shortage presents a complex challenge that requires a comprehensive and proactive approach.

Visual Components' research highlights the urgent need for manufacturers to invest in upskilling their current workforce and attracting new talent. By leveraging technologies such as simulation software and robot offline programming, companies can enhance employee capabilities, streamline operations, and create a sustainable workforce for the future.

We at Visual Components are committed to providing the fastest way from concept to reality, helping manufacturers navigate the skills shortage with innovative solutions. Join over **2,400** pioneers in transforming your manufacturing processes with us. Together, we can build a resilient and competitive manufacturing sector that thrives in the face of change.

Visual Components supports you every step of the way. For more information on how our solutions can help your organization overcome the skills shortage, visit our website or contact our team today. Let's make your vision a reality, faster and more efficiently than ever before.