

Revving Up the Future: Expert Insights on Tackling the Labor Shortages in Automotive Manufacturing

Five Expert Perspectives

The automotive sector is facing its most urgent challenge yet—not in technology or competition, but in human capital. As veteran experts walk out the door, they take irreplaceable decades of knowledge with them. Mitsubishi Electric's Global Factory Automation team reveals how smart automation isn't replacing humans but empowering them—creating effective systems that enhance productivity while preserving critical industry knowledge. Discover how innovators are turning this crisis into tomorrow's competitive advantage.

The Looming Skills Exodus

According to the National Association of Manufacturers (NAM) Manufacturers' Outlook Survey (Q4 2023), over 71% of manufacturing companies cite attracting and retaining a quality workforce as their top challenge. This issue is further compounded by projections from the U.S. Census Bureau and The Manufacturing Institute, which forecast an alarming 2.1 million unfilled jobs in the manufacturing sector by 2030 due to skilled labor shortages.

The automotive industry is currently facing a significant challenge as a large portion of its experienced workforce approaches retirement. This demographic shift is creating a knowledge gap that is difficult to fill, as many seasoned professionals take with them decades of expertise and insights. Developing effective knowledge transfer and retention strategies is now a critical business need with measurable impact on production continuity. As these veterans retire, the industry must focus on capturing their invaluable experience to ensure continuity and foster innovation for future generations.

Root Causes of Labor Shortages

The rapid advancement of technology in automotive manufacturing has created a widening skill gap. Modern production lines require expertise in areas such as robotics, AI, and data analytics—skills that are often in short supply. Anthony Pawlak, Director of Global Automotive Industry Solutions, U.S.A., emphasizes a related challenge: "Integrating new automation systems with legacy equipment is the most significant issue. There can often be a mismatch in technologies that are not easily bridged coupled with a skill gap in the workforce." This highlights how the coexistence of old and new technologies creates additional complexities, requiring workers to bridge not only technological gaps but also skill disparities within the workforce.

But bridging these gaps won't come easy as the automotive industry faces a generational divide in technological adaptability. Giuseppe Polimeni, Director GKAM and Japanese EU, observes: "The new generation is more open and quick to understand the latest automation technologies, while the older workers are more reluctant to engage." The gap between tech-savvy younger workers—who are hesitant to enter the sector—and experienced older workers—who struggle with new technologies—complicates workforce development and knowledge retention.

This creates a pressing need for solutions that not only retain knowledge within the company and facilitate its transfer to other employees, but also help make the industry appealing again to younger specialists—by providing them with the modern tools they expect.

Automation as a Solution

Automation offers a powerful solution to the labor shortage crisis in automotive manufacturing, but its successful implementation requires a thoughtful, employee-centric approach. Frederik Kok, Senior Cyber Security Expert at Mitsubishi Electric, reinforces this perspective: "Automation is being implemented with transparency and with active support for employees as they adapt to new tools and processes. Teams are continuously reassured that automation is neither a hindrance nor a replacement for human workers. Instead, it enhances efficiency and supports workforce

upskilling—through on-the-job training within automation programs, for example."

By prioritizing employee engagement and skill development, companies can leverage automation not only to maintain productivity and quality standards but also to foster a more skilled and adaptable workforce.

Lucas Majewski, Global Director of Automotive/EV Industry, Mitsubishi Electric, emphasizes the importance of early involvement and continuous communication: "Involving the automation team early in the process ensures participation from various managerial levels, so workers feel a sense of ownership and consider the final automation solution as their own. We also see advantages of keeping regular communication through weekly meetings; the purpose is to stay ahead of potential obstacles and provide timely solutions before issues materialize."

This approach addresses immediate labor gaps and creates opportunities for upskilling existing workers. Majewski adds, "Reskilling and upskilling of employees is actively taking place through the provision of technical support, access to test benches for hands-on practice, and on-site training."

Mitsubishi Electric's Solutions for Workforce Challenges

In addressing workforce challenges, Mitsubishi Electric experts highlight a suite of innovative solutions that integrate advanced technology with human expertise:

AI-powered Knowledge Retention

MELSOFT MaiLab is an AI-powered data analysis tool that significantly enhances knowledge transfer within organizations. Acting as a centralized repository of expert knowledge, it accelerates workforce development and upskilling. Christian Nomine, a Strategic Product Manager at Mitsubishi Electric Europe B.V., highlights the solution's capabilities, stating: "This solution caters to both beginner and advanced AI applications, augmenting human expertise and intuition with empirical data and insights. It supports the development of trainees and junior staff by providing access to a

distinctive, objective knowledge platform that fosters team and enterprise growth”.

Human-Robot Collaboration

Designed for safe human-robot collaboration, the cobots from the MELFA Assista series enhance both productivity and operational flexibility. With advanced sensors and force-limiting technology, they can operate safely alongside humans—allowing workers to focus on more value-added tasks while minimizing injury risks. As Lucas Majewski, Global Director of Automotive/EV Industry at Mitsubishi Electric, emphasizes: "Human-robot collaboration should be invested in to reskill and upskill the workforce." This approach not only helps fill immediate labor gaps but also creates long-term opportunities for employees to develop new competencies in an evolving manufacturing environment.

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Error-Proofing Assembly Processes

Smart Work Navigator is an advanced operator guidance system that reduces human errors and boosts efficiency in manual assembly processes. Based on the Japanese Poka Yoke principle, it provides interactive instructions and visual prompts, ensuring tasks are performed correctly the first time. At Martinshof Werkstatt Bremen in Germany, this system has enabled workers of all abilities to participate in error-free automotive parts production, resulting in consistently high quality and an inclusive workforce.

Virtual Production Optimization

MELSOFT Gemini's digital twin technology enables virtual simulations of production processes, allowing manufacturers to optimize layouts and reduce setup times before physical implementation. By testing various scenarios in a safe digital environment, businesses can improve planning and minimize risks during actual operations.

These solutions demonstrate how Mitsubishi Electric effectively integrates cutting-edge technology with human expertise to address workforce challenges in the automotive industry.

Automation and Human Expertise in Harmony

Addressing the automotive industry's labor shortage requires embracing innovative automation solutions. As experts note, these technologies have the potential to revolutionize productivity, quality, and efficiency in manufacturing. Looking ahead, the integration of AI, IoT, and robotics will redefine human roles—shifting towards oversight and innovation.

By prioritizing workforce development alongside targeted automation, manufacturers can not only respond to current labor shortages but also build more resilient operational models. A balanced integration of technology and human expertise drives measurable improvements in productivity and knowledge retention, positioning the automotive manufacturing sector for sustainable growth.

About the Report: "Drive the EVolution! Automotive Industry Factory Automation Expert Round-up Report 2025" combines insights from industry experts across Europe, Asia, and the Americas with real-world case studies and actionable recommendations for manufacturers aiming to stay ahead in a rapidly evolving industry.

About Mitsubishi Electric Corporation

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing, and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation, and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 5,521.7 billion yen (U.S.\$ 36.8 billion*) in the fiscal year ended March 31, 2025.

For more information, please visit www.MitsubishiElectric.com.

**U.S. dollar amounts are translated from yen at the rate of ¥150=U.S.\$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2025.*

About Mitsubishi Electric Factory Automation Business Group

Offering a vast range of automation and processing technologies, including controllers, drive products, power distribution and control products, electrical discharge machines, electron beam machines, laser processing machines, computerized numerical controllers, and industrial robots, Mitsubishi Electric helps bring higher productivity – and quality – to the factory floor. In addition, its extensive service networks around the globe provide direct communication and comprehensive support to customers. The global slogan "Automating the World" shows the company's approach to leveraging automation for the betterment of society through the application of advanced technology, sharing know-how, and supporting customers as a trusted partner.

For more about the story behind "Automating the World", please visit:

www.MitsubishiElectric.com/fa/about-us/automating-the-world