As we look towards 2024, the Vention team has identified five emerging trends in industrial automation. From labor challenges to AI, continue reading to explore the key trends that we predict will shape the industrial automation and manufacturing landscape in the coming year.

Curious about our past trend predictions? Revisit our blog on 2023 trends in industrial automation to see if our predictions came true.

1. Labor challenges will continue to impact businesses

In 2023, the manufacturing industry faced a significant challenge as about 10,000 Baby Boomers retired daily. This mass exodus, compounded by a lack of incoming talent entering the manufacturing sector at a comparable rate, had a noticeable impact. Projections indicate that by 2030, a staggering 21 million jobs are expected to remain unfilled, creating a substantial gap in the workforce.
To navigate the evolving landscape in 2024, business leaders must confront the reality of a shrinking pool of available workers while attempting to maintain or increase production volume. One key strategy to address labor challenges is the integration of automation alongside the existing workforce. By automating manual, repetitive, and dangerous tasks, businesses can shield their production lines from the impact of high turnover rates. Moreover, this approach enables current employees to transition to more skilled roles, such as machine operators and programmers.

A Deloitte Global Human Capital Trends Study underscores the urgency of reskilling the workforce, with 75% of industrial organizations acknowledging its importance for success in the upcoming year. However, a mere 10% expressed confidence in their readiness to address this critical trend. This disparity highlights a widespread awareness of the impending labor shortage but a corresponding lack of knowledge on how to effectively tackle it.

For a successful transition, manufacturers are encouraged to implement automation solutions with a low barrier to entry. This approach ensures that workers without advanced technical automation skills can readily adopt and adapt to this transformative technology. With automation and humans working alongside each other, manufacturers are not as vulnerable to ongoing labor challenges and can successfully boost production and efficiency—the key to thriving in the face of the evolving dynamics in the manufacturing workforce.

2. Automation will become a necessity, not just a “nice to have”

Over the past three decades, the industrial automation industry has undergone a gradual evolution. With complex, legacy technology and large capital investments, industrial automation was created and priced for high-throughput manufacturing. Today, recent forces, such as the labor shortage and the COVID-19 pandemic, have increased the demand for automation, resulting in rapid evolution in the accessibility of automation technology.
As automation continues to advance, there is a notable shift in its social perception. Contrary to the belief that automation displaces jobs, it is becoming increasingly evident that it is, in fact, creating more employment opportunities. In a Future of Jobs report, it was found that 97 million new roles may emerge as a result of adopting automation. In addition, the International Federation of Robotics reports that less than 10% of jobs can be completely automated. Instead of replacing jobs, robots are eliminating repetitive tasks, allowing human workers to redirect their efforts toward more meaningful and dynamic work.

In 2024, automation will become a necessary part of production lines for manufacturers. The benefits are indisputable, from increased productivity, efficiency, return on investment, and more—making automation the solution for withstanding the challenging economic conditions.

Beyond the business advantages, automation has proven results in enhancing job satisfaction and well-being for workers, contributing to increased retention rates. Additionally, it aligns with the trend of reshoring and near-shoring, fostering socially responsible productions closer to home. It is clear—the time to embrace automation is now.

3. Speed will emerge as a top priority

In 2024, speed to automation is poised to become a crucial differentiator as more manufacturers acknowledge the necessity of automation technology. According to research from Assembly Magazine, increased demand for automation has surged lead times within the last few years. One integrator reports seeing an increase in lead time by 50 to 100 percent, severely impacting commitments to their customers.

Many industries, especially those characterized by shorter product lifecycles, have recognized speed from design to operation as crucial for staying ahead. Assembly reports that “82% of engineers rank delivery time as an important factor when selecting components for an automation project. Only quality (96%) and service and support (93%) obtained a higher rate. Price is a distant fifth.”
These results come as no surprise. The process of implementing traditional automation technologies, from initiation to completion, can stretch over a year. This extended timeline is a result of the intricate nature of the technology, the involvement of multiple vendors, and the growing prevalence of long lead times. Thanks to recent advancements, such as the collaborative robot (cobot) and the Manufacturing Automation Platform (MAP), the time to automate is significantly decreasing.

The Manufacturing Automation Platform seamlessly integrates engineering software and modular hardware within a unified digital environment, effectively erasing the boundaries between the digital and physical realms. This close integration streamlines navigation through the design, automation, deployment, and operation stages of creating automated equipment. Consequently, manufacturers can now transition from design to operation within a matter of days or weeks, a stark departure from the traditional timeline spanning months or even years. This acceleration in the speed to automation promises to enhance production efficiency, productivity, and return on investment.

MAP embraces the ethos of the “Amazon era” by enabling the dispatch of custom machinery the next day, facilitated by modular components and a predefined parts library. Centralizing all activities onto one platform allows manufacturers to shorten project timelines, achieving automation 3x faster. This rapid pace of automation serves as a pivotal differentiator, aligning with the growing emphasis on speed in 2024.

4. Do-it-yourself automation and the creation of Advanced Manufacturing Teams will rise

“Do-it-yourself” or “DIY” automation is the practice of independently designing and implementing industrial automation systems by utilizing plug-and-play hardware and software components. With ongoing innovations in the industrial automation industry that make automation more accessible, the DIY approach is gaining traction and is expected to continue thriving in 2024.

Within the Manufacturing Automation Platform, small-sized businesses emerge as the primary adopters, showcasing the growing prevalence of DIY automation in this sector. Notably,
manufacturers with fewer than 200 employees were previously hindered by the complexity and cost of automation technologies. Now, they are not only embracing automated solutions at the highest rates but also realizing the value of flexibility and customization. Leveraging modular hardware and intuitive software, these businesses can effortlessly create and repurpose multi-mission solutions to adapt to shifts in customer demand.

Moreover, DIY automation, in collaboration with the Advanced Manufacturing Team, is opening new opportunities for forward-thinking system integrators who recognize the value of this democratized technology. Platforms like MAP provide them with a competitive advantage by enhancing speed and ease of use. In 2024, the traditional business model is anticipated to continue evolving towards the embrace of vertically integrated automation platforms. This shift allows both system integrators and manufacturers to deliver more efficiently and rapidly, aligning with the changing dynamics of the industry.

5. Artificial Intelligence will enable faster and more efficient processes

In the upcoming year, one of the overarching trends set to shape various business sectors is the integration of Artificial Intelligence (AI). In the context of industrial automation and manufacturing, our predictions point towards a nuanced evolution of AI, unfolding across three distinct categories.

Firstly, we anticipate the emergence of the “Industrial Copilot.” This concept, often likened to the “ChatGPT” of programming, blends human-machine collaboration to enhance efficiency and effectiveness in industrial processes.

The second category, Autonomous Robots, is a growing trend where robots can be programmed with little to no human intervention. This shift from motion-based robotics, where programmers explicitly define robot motion, to mission-based robotics allows robots to understand process constraints and can perceive and adapt to their environment to complete complex missions. Mission-based robotics has the potential to reduce high-mix, low-volume manufacturer’s dependency on skilled robot programmers and enable them to automate their operations successfully.
The third category, Machine Learning, takes the concept of AI further by enabling robots to learn and improve from experience. The potential of machine learning is limitless and can greatly improve manufacturing quality inspection, personalization, and more.

A crucial intersection where these trends converge lies in the connection between the second and third categories: autonomous robots and machine learning. The synergy between these two elements is poised to be a game-changer, with advancements in machine learning catalyzing the capabilities of autonomous robotics. The most noteworthy outcome of this synergy is the potential to use measured data points acquired directly from the factory floor to autonomously optimize manufacturing processes to be more efficient and reliable with superior quality. This has the potential to partially or even completely replace the domain knowledge expertise required to successfully automate and optimize manufacturing processes today.

**Conclusion**

In 2024, industrial automation is poised for a transformative year. As more manufacturers begin to adopt automation technology, the industry will continue to experience rapid evolution. The more it evolves, the more manufacturers can profitably adopt automation to increase their productivity, see stronger ROI, and withstand labor challenges. 2024 is the time to automate, and we believe that these five trends will significantly drive the industry forward within the year to come.

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