



The Future of Manufacturing in 2024: Seven Transformative Trends and Predictions

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In a global economic environment that finds many nations recovering from the post Covid-19 slump, the near term is looking hopeful as 2023 continues to exceed initial expectations, setting the stage for continued growth in the year ahead. This optimistic outlook for business lays the foundation for a spate of trends in the manufacturing sector. **Here are the seven most pertinent developments that are the most likely to occur in 2024.**

1 The Accelerating Convergence of IT and OT

Historically, IT and OT (operational technology) have been siloed from each other within manufacturing organizations. But the growing complexity of industrial software is forcing greater integration. OT teams recognize the need to adopt IT strategies like agile development, cloud platforms, and automated CI/CD pipelines.

In 2024, cloud adoption will hit an inflection point across the OT sphere. Data management and application development will increasingly shift to the cloud to leverage scalability and accessibility.

At the same time, edge computing and hybrid architectures will expand, allowing for fast identification and containment of software problems, and rapid responses and reduced recovery times. By processing and analyzing data locally on-premise while also connecting to the cloud, manufacturers can take advantage of enhanced speed and security.

2 Emergence of Industrial DevOps

Factories now run an exceedingly high amount of software that control production lines, coordinate robots, route materials, aggregate data, and more. Managing this complex technology stack requires standardized processes and tooling. DevOps practices borrowed from enterprise software development are a natural fit for industrial automation engineering, offering superior control, visibility, and backup.

Copia's Industrial DevOps platform eliminates manual and tedious tasks, and provides clear visibility of the code that is running on the plant floor for easy comparisons to previous versions. This superior visibility and control help with troubleshooting and maintenance, resulting in decreased downtime and shorter recovery times. Any future tweaks to the code are automatically updated in the source control repository, avoiding any errors caused by manual updates, with automatic alerts flagging unauthorized changes.

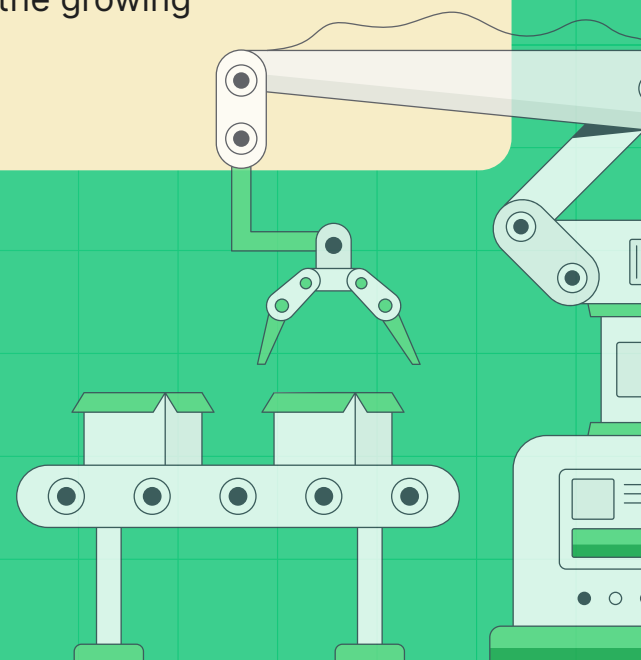
In 2024, "Industrial DevOps" will become a more broadly recognized term. OT teams will adopt solutions that allow version control, continuous integration and delivery, test automation, and collaboration for automation code development and delivery to the factory floor. By aligning developers with business goals, enterprises can quickly eliminate silos, accelerate innovation, and reduce risk.

3 Automation Fills the Workforce Gap

Manufacturers continue to struggle with hundreds of thousands of open jobs, especially for technical roles like control engineers. With limited talent to draw from, automation will fill the gap. Companies will invest heavily in technologies such as industrial AI, collaborative robots, and software automation.

For software specifically, the shortage drives adoption of solutions that maximize productivity of existing developers. Automation tools that simplify coding complex systems, streamline debugging, and provide self-service access will fundamentally change how much lean teams can accomplish, and enable engineers to become exponentially more productive.

These tools will become critical to meeting the growing consumer demand for products.



4 Government Stimuli Will Advance Key Industries and Reshoring

Several recent government initiatives are providing strong incentives for domestic manufacturing. The CHIPS Act boosts semiconductor production, while the Inflation Reduction Act (IRA) offers subsidies for clean energy technologies. We expect particular growth in electrical vehicles, renewable energy systems like solar photovoltaic (PV) panels, and energy storage.

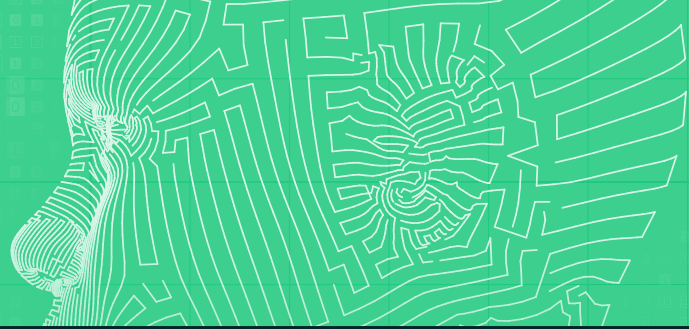
This will contribute to the ongoing reshoring trend as critical industries build new factories and expand production as the U.S. government stimulus helps level the playing field against lower-cost overseas locations. Manufacturing jobs and investment will continue returning to the U.S. as a result of these policies.

5 Sustainability Transforming Factory Operations

Sustainability will remain a priority across industries, particularly for manufacturers with large physical footprints. Clean technologies will drive major change on two fronts: producing green products and adopting them within factory operations.

U.S. companies are gearing up solar PV panel production at scale. Constructing these high-tech renewable plants requires automating manual processes, leading to safer and more consistent output with less labor intensity.

Factories will also integrate more green technologies to reduce environmental impact and energy consumption. Solar, wind, battery storage, EV fleet vehicles, and other innovations will become normalized parts of manufacturing operations.



6 AI Will Slowly Emerge on the Plant Floor

Industrial AI holds tremendous potential to take automation to the next level. But AI's broad impact on core manufacturing processes remains largely theoretical. Niche use cases like predictive maintenance are gaining traction. However, direct operational control requires extremely robust, fail-safe systems.

Overall, there will likely be incremental adoption of industrial AI in 2024 — not a revolutionary breakthrough. Machine learning algorithms require massive amounts of training data before deployment, and collecting accurate datasets across variable factory conditions poses challenges.

AI will assist human operators and engineers rather than replace them outright any time soon. Its role in assisting developers and creative teams to plan, design, and implement new visions will increase steadily, however, it will likely take more time before we see the evidence of AI on the factory floor.

7 Macro Outlook: Cautious Optimism

Despite ongoing supply chain disruptions and simmering inflation, manufacturing activity will continue to expand. Barring unpredictable events, the overall economic outlook remains positive for the industry. Strategic investment in automation, software innovation, and workforce development will best position manufacturers to find growth and resilience regardless of market conditions.

Keep the Conversation Going

I have little doubt that 2024 will see great strides in how companies reinvent operations for the future. With the latest advances in technology and methodology, industrial automation is set to have a very bright year and we at Copia Automation look forward to partnering with forward-thinking manufacturers during this most transformative period.

Schedule time with our team

if you'd like to speak about your business needs further.



Copia Automation delivers modern developer tools for industrial automation. Our Git source control and automatic backup solutions for PLCs and control devices streamline workflows for faster delivery and maximized uptime.