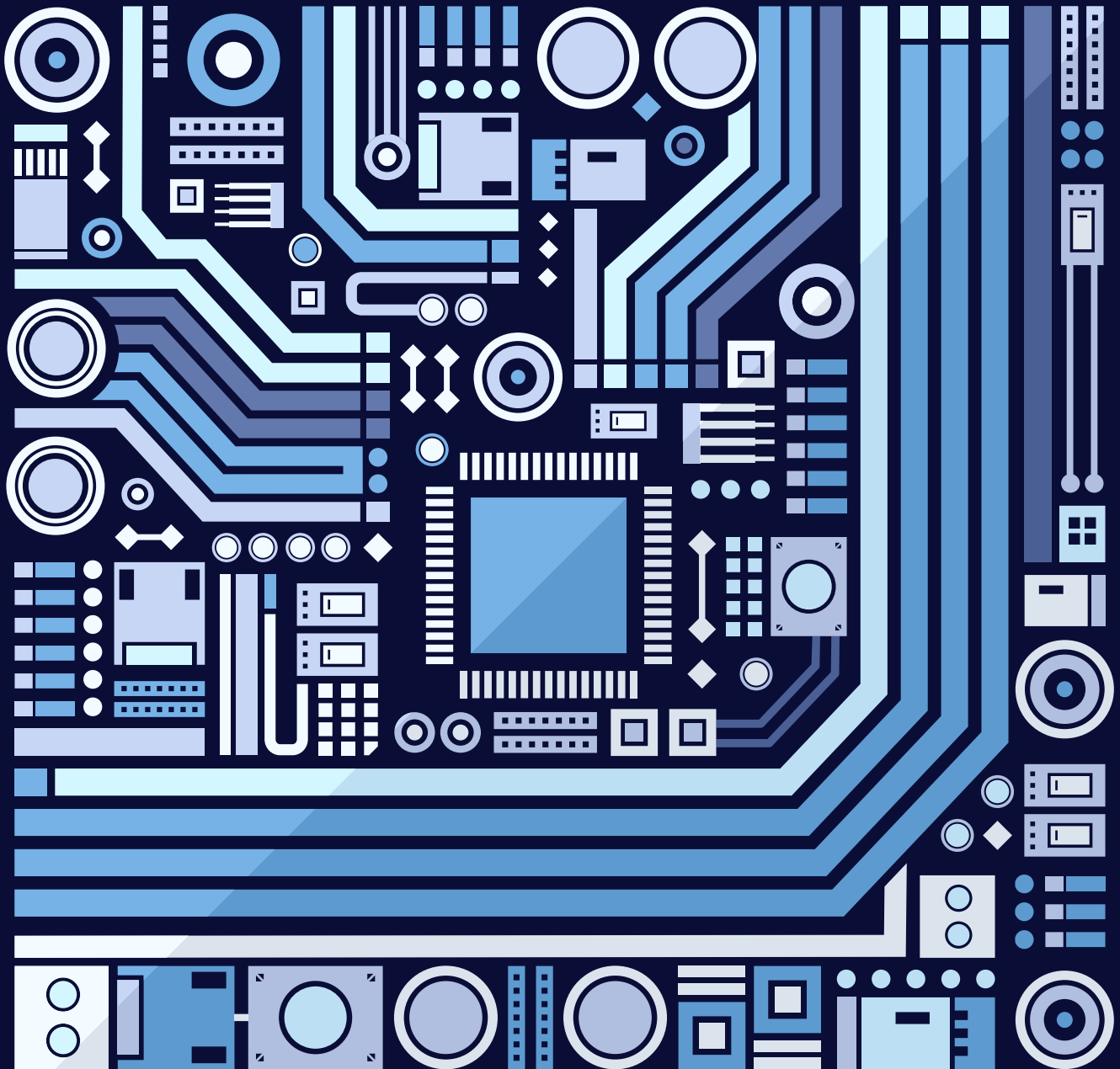


AI Innovations for Metal Manufacturers: Unlocking Efficiency and Growth



An Introduction to AI for Job Shops,
Machine Shops, Service Centers,
and Metal Fabricators



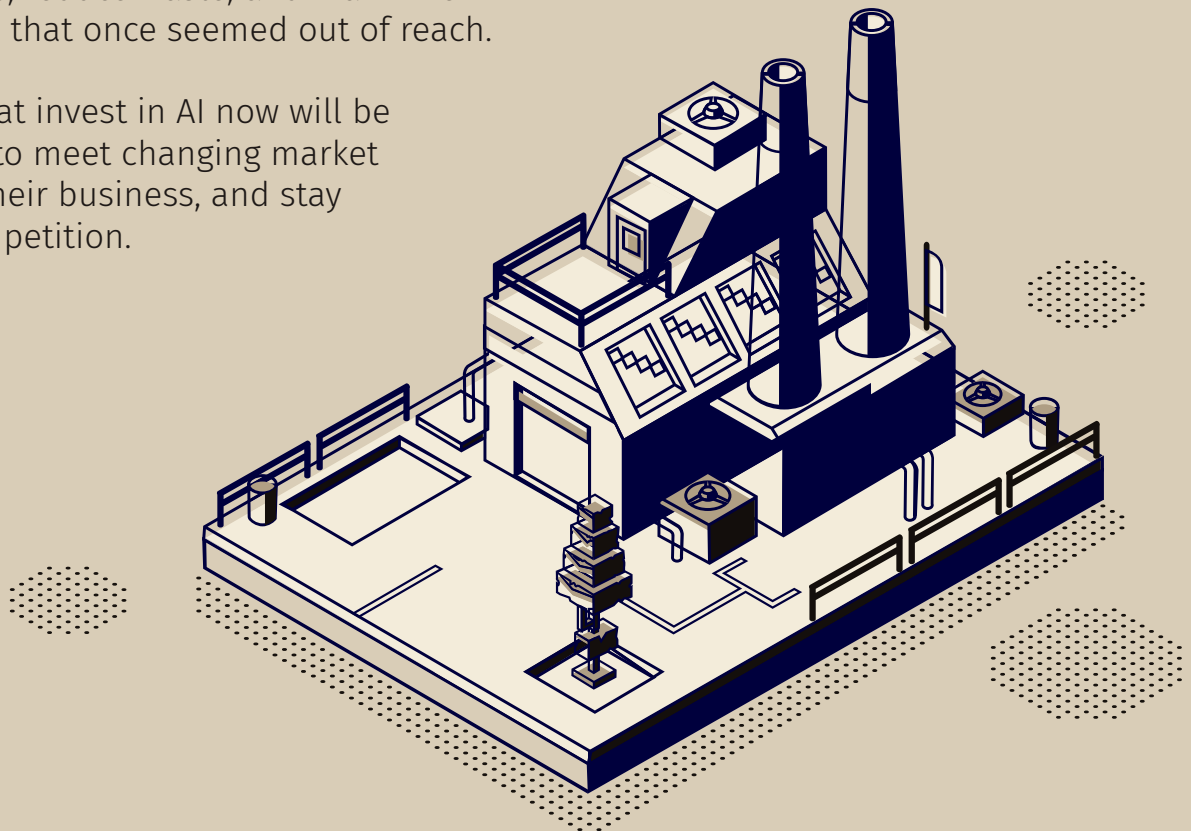
Why AI Matters to Metal Manufacturers

Artificial intelligence (AI) is changing the way metal manufacturers work, from sales and estimating to production and operations. By integrating data-driven insights and automation, AI-powered tools help manufacturers work smarter, faster and more efficiently.

Metal manufacturers today are dealing with rising material costs, labor shortages and fluctuating demand. AI can help at every stage from creating more accurate quotes and optimizing sales pipelines to automating production tasks and improving quality control. With tools like predictive maintenance, AI-powered sales solutions, smart supply chain management, and automated workflows, metal manufacturers can keep operations running smoothly and adapt more easily to changing conditions.

For job shops, machine shops, and metal fabricators, AI offers new ways to improve efficiency and cut costs. With AI, manufacturers can make faster, smarter decisions, reduce waste, and maximize efficiency in ways that once seemed out of reach.

Manufacturers that invest in AI now will be better equipped to meet changing market demands, grow their business, and stay ahead of the competition.





Who Should Read This?

- Decision-makers in fabrication shops, service centers, and metal manufacturing companies
- Leaders in operations, IT, finance, and sales looking to drive efficiency and cut costs
- Manufacturers interested in AI solutions to improve productivity and future-proof their business



What You'll Learn?

- Practical applications of AI in metal manufacturing
- Real-world examples of AI-driven technologies
- New trends shaping the future of AI in metal fabrication

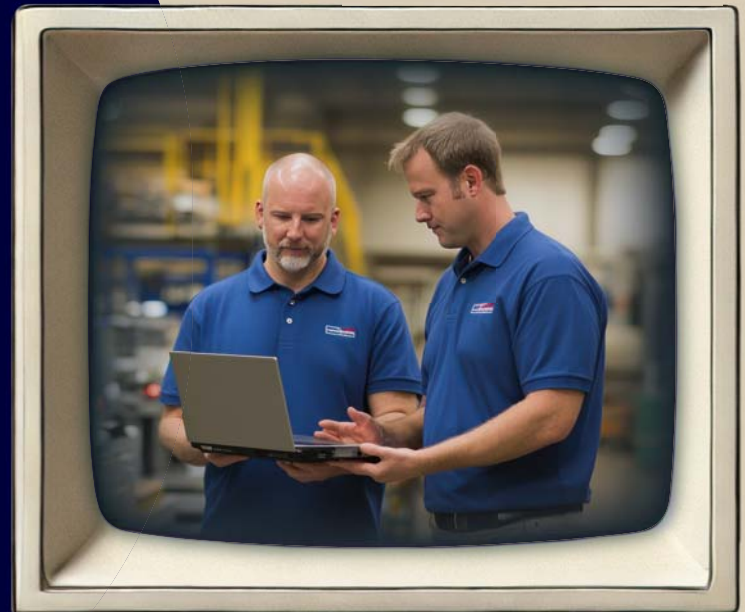


AI Innovations Are Transforming Metal Manufacturing

AI is helping metal manufacturers work smarter.

With AI-powered technology, manufacturers can improve product quality, make better decisions, and maximize machine performance. Innovations like predictive maintenance and demand forecasting are already making a big impact, giving companies an edge in an increasingly competitive industry.

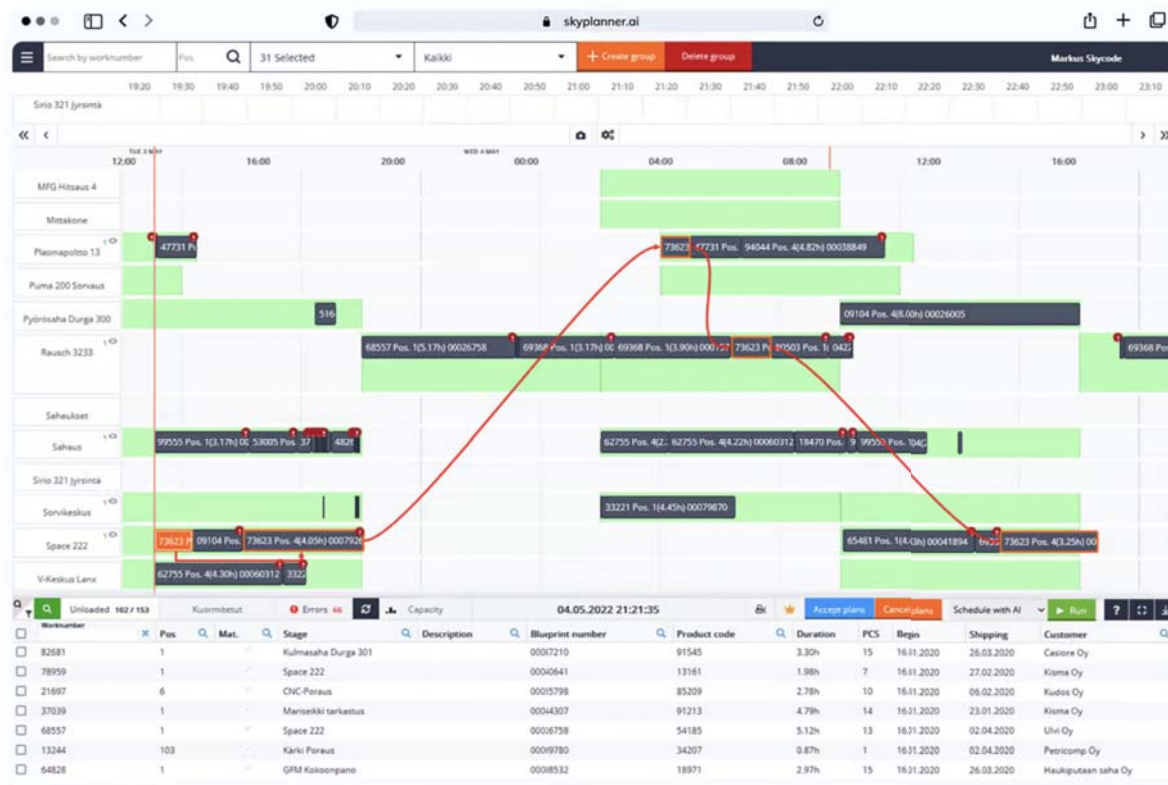
This guide highlights eleven exciting examples of how AI is being used in metal manufacturing today—demonstrating what's already possible and offering a glimpse into the future of the industry.



Featured Innovations

- 1 |  Optimized Production Scheduling
- 2 |  Predictive Maintenance
- 3 |  Automated Quality Inspection
- 4 |  Adaptive Machining
- 5 |  AI-Powered Quoting
- 6 |  Workforce Augmentation
- 7 |  Demand Forecasting
- 8 |  AI Workflows and Conversational Help Agents
- 9 |  Smart Energy Management
- 10 |  Automated Welding and Cutting
- 11 |  Real-Time Analytics and KPI Tracking

1 Optimized Production Scheduling



Description: AI-driven scheduling tools analyze real-time production data to optimize workflows, reduce delays, and improve delivery times. AI scheduling systems consider many factors, including order priority, raw material availability, workforce capacity, and machine performance to develop the most efficient production schedules. These systems also automatically adapt as new data comes in, keeping schedules on track even when unexpected changes arise.

Instead of manually updating spreadsheets, manufacturers can use AI to automate scheduling—saving time, improving accuracy, and reducing costly errors.



Real-World Example:

SkyPlanner APS provides AI-powered production scheduling that integrates with ERP and MES systems to create real-time optimized schedules. SkyPlanner's AI assistant, Arcturus, instantly adjusts shop schedules when production conditions change, helping manufacturers increase output, reduce downtime, and meet deadlines more reliably.



2 Predictive Maintenance

Description: Predictive maintenance helps manufacturers prevent equipment failures by using sensors, real-time data, and machine learning. Instead of reacting to breakdowns, AI detects potential issues early so maintenance can happen before problems occur. This reduces downtime, prevents unexpected failures, and extends equipment life.

With AI, manufacturers can switch to condition-based servicing that responds to actual machine performance. Rather than servicing equipment on a set schedule, manufacturers can now use AI to track actual machine performance and service equipment only when needed. That means fewer unnecessary maintenance stops, lower costs, and smoother operations.



Real-World Example:

Augury's AI-powered machine health monitoring system helps manufacturers predict failures and optimize maintenance schedules. Its advanced algorithms analyze real-time machine data, helping companies prevent costly breakdowns and keep production running smoothly.



3 Automated Quality Inspection

Description: AI-powered inspection systems use machine learning and computer vision to spot defects and inconsistencies with far greater accuracy than manual inspections. By analyzing thousands of images in real time, AI can catch even the smallest flaws that might slip past human inspectors.

Automating quality inspection helps manufacturers reduce scrap, improve product reliability, and avoid costly rework. AI can also learn from past inspections to continuously improve its ability to detect defects and refine quality control processes—boosting efficiency and helping manufacturers meet strict industry standards.



Real-World Example:

VisiConsult makes AI-powered X-ray inspection systems for non-destructive testing (NDT). Their technology enhances quality assurance by identifying defects in real time, improving quality control. By using AI in their inspection processes, VisiConsult makes inspections faster, more accurate, and more consistent while reducing human error.



4 Adaptive Machining

Description: AI-powered machining improves precision and efficiency by automatically adjusting cutting paths, feed rates, and tool changes. Instead of relying on fixed settings, AI systems use machine learning to analyze material hardness, tool wear, and machining conditions to make instant adjustments that optimize performance.

Adaptive machining reduces waste, prevents tool damage, and improves accuracy in part production. By eliminating the trial-and-error approach of traditional machining, AI-driven systems ensure consistent quality even in complex production environments. Manufacturers benefit from faster cycle times, smoother surface finishes, and longer tool life—leading to lower costs and higher-quality products.



Real-World Example:

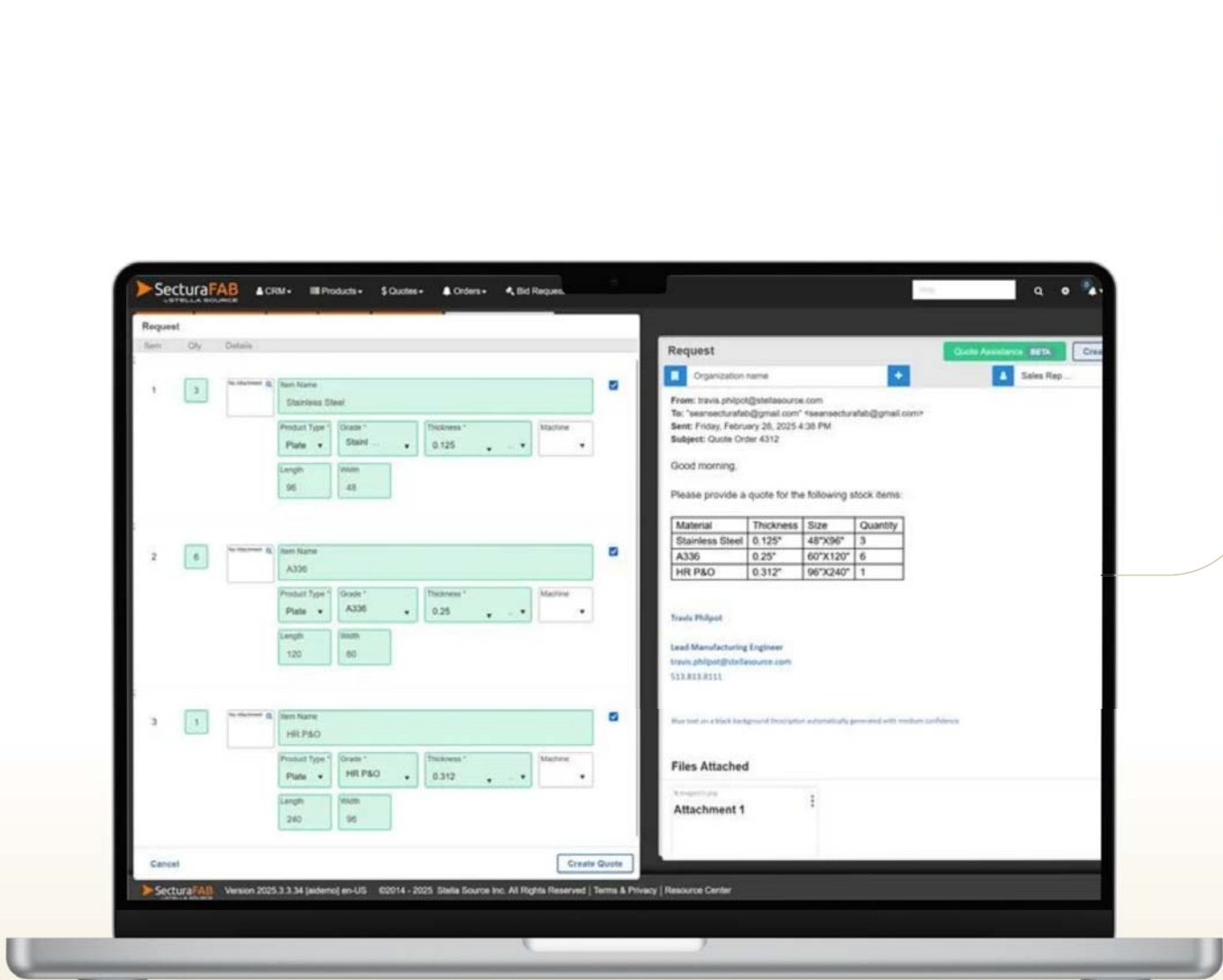
Makino's adaptive machining technology, including AI-driven wire EDM, helps metal manufacturers achieve higher precision while improving efficiency. Its system automatically adjusts machining parameters based on workpiece height and compensates for wire wear and lag—resulting in straighter, more accurate parts, shorter cycle times, less maintenance, and a more streamlined production process.



5 AI-Powered Quoting

Description: AI-powered quoting helps metal manufacturers generate faster, more accurate quotes by automating data extraction and processing. Instead of manually entering information from emails, PDFs, or CAD files, AI scans and interprets customer requests, pulling key details like part dimensions, material types, and quantities. Using machine learning and natural language processing (NLP), AI can convert unstructured data—like an email request—into structured quote line items.

This eliminates tedious manual entry, reduces errors, and dramatically speeds up response times, helping manufacturers secure more jobs and improve overall efficiency. With AI handling the heavy lifting, sales teams can focus on customers instead of paperwork.





Real-World Example: SecturaFab by Stella Source uses AI to extract, process, and organize quote details in seconds to reduce manual work and response times. Instead of clicking through multiple screens and retyping information, users can generate a quote in as few as six clicks.

SecturaFAB's **Quote Assist Technology** automates two major tasks:

- **Text-to-Quote** – AI reads emails and pulls key details like materials, dimensions, and quantities into a structured quote.
- **Image-to-Quote** – AI scans PDFs and CAD files, extracting part numbers, material grades, and tolerances for an accurate, ready-to-use quote draft.

Because SecturaFAB integrates with CRM systems, all quote requests are centrally stored, making it easy to track and follow up with customers. The system reduces data entry errors, speeds up response times, and ensures quotes are more accurate, giving manufacturers a competitive edge. Instead of spending hours on administrative work, sales teams can focus on winning jobs and growing the business.

Unlike generic AI tools, SecturaFAB is built specifically for metal manufacturing and combines cutting-edge AI technology with Stella Source's deep industry expertise. SecturaFAB isn't just about speed—it's about quoting smarter, more accurately, and giving manufacturers the insights they need to win more jobs.



6 Workforce Augmentation

Description: AI-powered robotics are making automation easier to implement, helping manufacturers cut manual labor and boost productivity. By using AI, robotics can adapt to real-world conditions, make quicker decisions, improve motion control, and simplify deployment. That means less time spent on programming and setup and more time focused on production.

By integrating AI with collaborative robots (cobots), manufacturers can automate repetitive tasks and improve accuracy. AI-powered robotics allow metal manufacturers to increase output without expanding their workforce, making automation a cost-effective solution for growing demand.

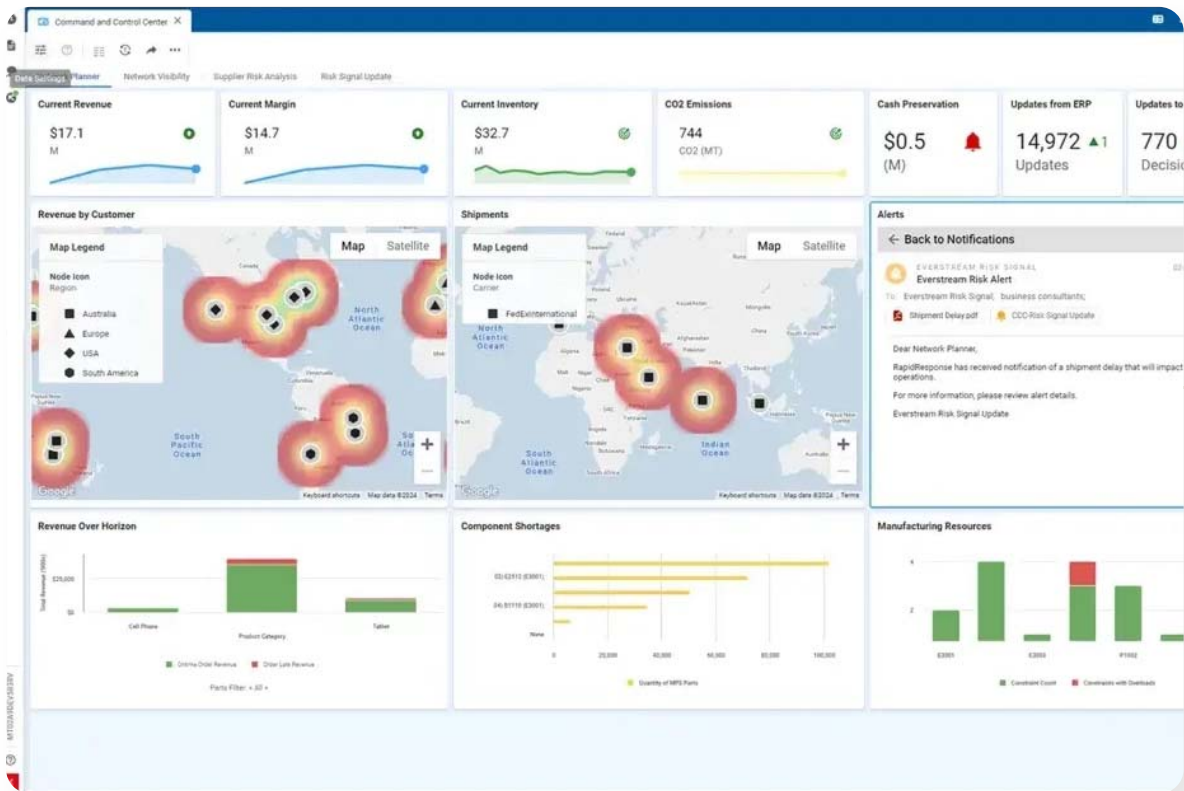


Real-World Example:

Universal Robots' AI Accelerator enhances cobot performance by using computer vision and machine learning to improve decision-making and motion control. It also integrates seamlessly into existing systems, reducing setup time and giving manufacturers the flexibility to scale as needed.



Demand Forecasting



Description: AI-powered demand forecasting helps manufacturers stay ahead of customer needs leading to better inventory management and a more responsive supply chains. Unlike traditional forecasting which relies on historical data, AI uses real-time market trends, economic shifts, and customer behavior to improve accuracy.

With AI, manufacturers can prevent stockouts, reduce excess inventory, and adapt more quickly to market changes. Aligning production more closely with demand leads to better cash flow and boosts operational efficiency.



Real-World Example:

Kinaxis uses AI and machine learning to analyze market trends and identify supply chain inefficiencies, giving manufacturers a competitive edge. Its advanced algorithms adjust forecasts as new data becomes available, letting manufacturers respond faster, use resources more efficiently, and cut costs related to inaccurate demand predictions.

AI Workflows and Conversational Help Agents

Description: AI is set to transform ERPs. ERPs hold mountains of data and require users to learn dozens of processes. Using conversational assistance and AI-powered guidance, it is possible to make ERPs easier to learn and operate with the use of natural language help bots. These AI agents will allow users to ask questions and receive guidance for completing tasks, finding information, or even analyzing data.



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Real-World Example: Genius ERP's new embedded AI, Genius Cortex, is set to redefine how manufacturers interact with their ERP system in two critical ways. First, Genius Cortex will act as an intelligent help agent, answering natural language questions to simplify onboarding and daily tasks. Second, by using Retrieval-Augmented Generation (RAG) to analyze ERP data and external documents, users will be able to quickly summarize information, compare data, and uncover useful insights.

- **Help Agent** – Users can ask Cortex a plain-language question, like "How do I create a purchase order?" and get an instant answer, pulled from documentation, training materials, and the Genius Cortex knowledge base. Cortex will be able to walk users through tasks step by step or suggest features based on their questions, making it easier to learn the system, reduce onboarding time, and get work done without extra support.
- **Multimodal Agent** – This RAG tool does more than just answer basic questions. It pulls data from different sources—both inside Genius ERP and from external documents—to provide clear insights. For example, a user can upload a supplier contract and an inventory report, and then ask, "How do these lead times compare to our historical delivery data?" Cortex will analyze the data and generate a quick, accurate summary—with minimal manual work needed.

Genius ERP will continue to grow Cortex over the next 18 months with automated data processing, intelligent workflows, AI system monitoring and predictive insights.



9 Smart Energy Management

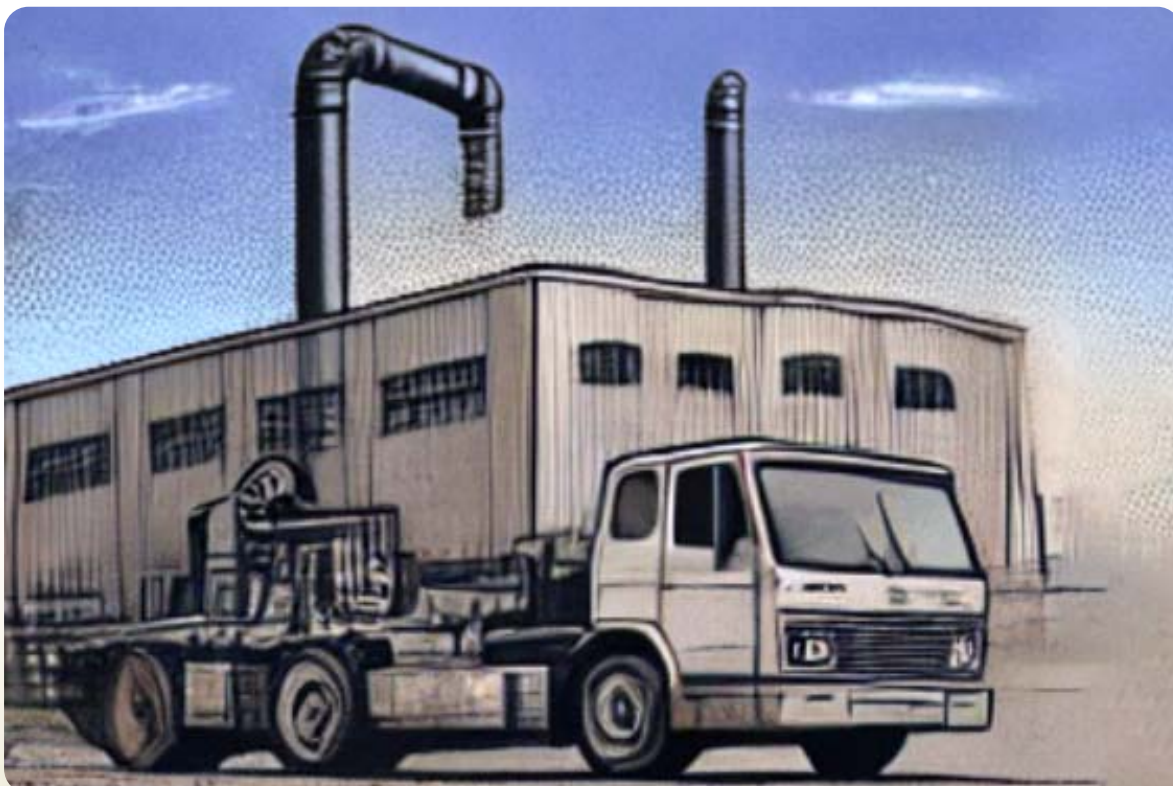
Description: AI is helping manufacturers optimize energy use, lower costs, and improve sustainability. With real-time monitoring and machine learning, AI-powered energy management systems can detect inefficiencies, predict energy demand, and make automatic adjustments to reduce waste.

By continuously analyzing energy consumption, manufacturers can identify performance issues, and extend the life of critical assets. AI also helps companies forecast energy needs, prevent equipment failures, and make smarter, data-driven decisions that improve both profitability and environmental impact.



Real-World Example:

AVEVA's AI-powered energy management solutions help manufacturers cut energy waste, improve reliability, and streamline operations. With AI-driven predictive analytics, manufacturers can catch potential issues early—before they turn into costly failures. Real-time insights and automated process adjustments make it easier to keep operations running smoothly and efficiently.



10 Automated Welding and Cutting

Description: AI-assisted welding and cutting systems automate complex welds and adjust cutting parameters to improve precision, consistency, and efficiency. While traditional welding relies heavily on skilled labor, AI-powered solutions let manufacturers achieve high-quality results with fewer manual adjustments.

These systems use advanced sensors, machine learning, and robotics to make real-time adjustments based on changes in materials, welding positions, and environmental conditions to create stronger, more consistent welds. With AI, manufacturers can reduce defects, cut down on rework, and improve shop floor safety. AI-powered welding systems can also track and analyze welding data, helping manufacturers refine processes and maintain strict quality standards.

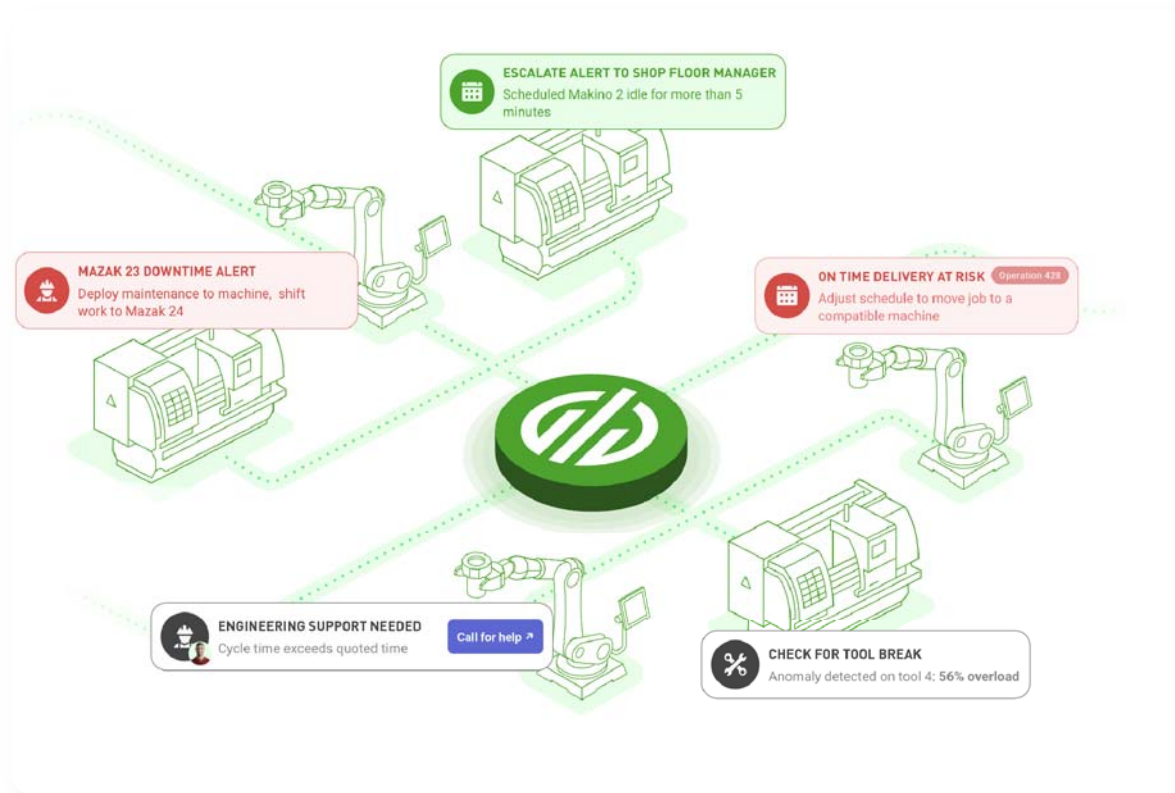


Real-World Example:

Novarc Technologies makes AI-powered welding cobots that boost speed and accuracy while reducing the need for highly skilled welders. Their NovAI system automatically adjusts welding parameters based on sensor feedback, improving quality, reducing waste, and increasing overall throughput.



11 Real-Time Analytics and KPI Tracking



Description: AI turns production data into real-time insights, letting manufacturers track key performance indicators (KPIs) and make more informed decisions. With AI-driven analytics, manufacturers get instant visibility into production processes and can quickly spot inefficiencies and fine-tune processes to improve overall efficiency.

Unlike manual reporting, AI-powered analytics provide live updates, letting manufacturers identify and resolve issues before they become bigger problems. AI tracks key metrics in real time, giving manufacturers the data they need to adjust shop floor operations and keep things running smoothly.



Real-World Example:

MachineMetrics offers real-time production analytics that helps manufacturers reduce workflows, downtime, and equipment efficiency. Their platform provides instant visibility into machine performance so that manufacturers can quickly respond to issues, cut unplanned downtime, and increase production output.

Key Benefits of AI for Metal Manufacturers

AI is transforming metal manufacturing, giving manufacturers tools to streamline production and cut costs. With AI-driven solutions, manufacturers can automate repetitive tasks, gain real-time insights, and make smarter decisions to stay competitive.

Key benefits of AI for manufacturers include:

- **Increased Efficiency** – Less downtime, optimized scheduling, and better machine utilization keep production running smoothly
- **Cost Savings** – AI reduces waste, optimizes energy use, and improves inventory management, cutting unnecessary costs
- **Better Quality Control** – AI-powered defect detection and adaptive machining improve precision and reduce rework
- **Faster, Smarter Decision-Making** – Real-time insights help manufacturers spot inefficiencies and make quick, informed adjustments
- **Stronger Supply Chains** – AI analyzes demand trends, helping manufacturers avoid stock shortages, prevent overproduction, and keep inventory levels balanced
- **Workforce Support & Automation** – AI automates repetitive tasks, like creating quotes and guiding ERP users through complex workflows, freeing workers to focus on higher-value, skilled work
- **Future-Proofing** – AI helps manufacturers stay ahead by improving adaptability and efficiency in a rapidly changing industry



Conclusion: The Future of AI in Metal Manufacturing

AI is no longer a futuristic concept—it's here, and it's driving real results for metal manufacturers. From improving sales processes to optimizing scheduling, streamlining operations, and improving quality control, manufacturers that embrace AI today will be the industry leaders of tomorrow.

Now is the time to explore AI solutions and integrate them across your business. The future of metal manufacturing is AI-driven, and manufacturers that embrace these innovations will gain a lasting competitive edge setting themselves up for long-term success.

Ready to quote faster and win more jobs?

SecturaFAB streamlines your quoting process so you can respond quicker, improve accuracy, and close more deals.



Book A Demo

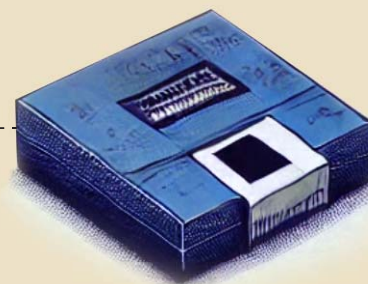
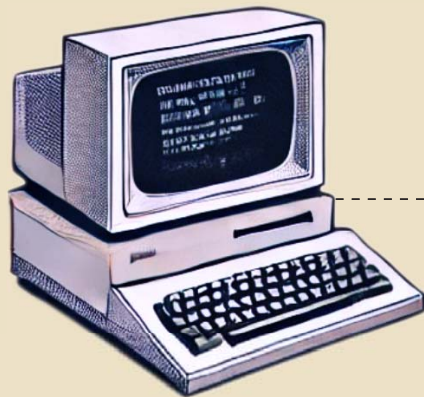


Manufacturers need a manufacturing ERP.

Genius ERP is built for manufacturers, by manufacturing experts. Get the ERP you deserve.



Book A Demo



Appendix: AI Resources for Metal Manufacturers

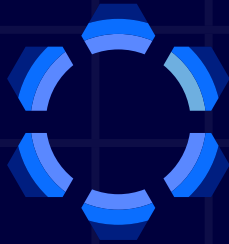


For further reading and exploration, consider these AI resources:

- **SkyPlanner APS** – AI-driven production scheduling
- **Augury** – Predictive maintenance solutions
- **VisiConsult** – AI-powered quality inspection
- **Makino** – Adaptive machining technologies
- **SecturaFAB by Stella Source** – AI-powered quoting
- **Universal Robots** – Elevating automation through AI
- **Kinaxis** – Demand forecasting and supply chain optimization
- **Genius ERP** – Natural language help agents integrated with ERP
- **Aveva** – Sustainable industrial AI solutions
- **Novarc Technologies** – AI-assisted welding solutions
- **MachineMetrics** – Real-time manufacturing analytics

By staying informed and investing in AI-powered solutions, metal manufacturers can unlock new levels of efficiency, quality, and profitability.





For over 35 years, Genius ERP has been innovating to help manufacturers across North America streamline operations and drive growth. We understand that manufacturing isn't just another department—it's your entire business. That's why our ERP is purpose-built to handle the complexities of production, scheduling, inventory, and shop floor operations. Backed by industry experts, we provide the tools and support manufacturers need to streamline operations, reduce waste, and deliver on time.



Founded in 2022, Stella Source is the North American leader in digital commerce solutions specifically designed for the metals industry. The company offers a wide range of products and services designed to eliminate the bottlenecks throughout every stage of buying and selling materials and processed parts by empowering distributors and service providers with efficient, relationship-focused tools. With Stella Source, our partners are reducing time-to-quote and accelerating time-to-money with ecommerce and online invoicing.

