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Do what matters

Avanade Trendlines AI Value Report 2025

Manufacturing

EXECUTIVE SUMMARY

AI Value Report 2025

Mid-market manufacturers are optimistic about AI ROI, but face challenges with people, data and tech infrastructure

Overcoming data challenges to create new value in manufacturing

New research from Avanade reveals that AI is transforming manufacturers of all sizes in every sector. Known for their speed, innovation, and resilience, mid-market firms are leading the way. Cost-conscious and growth-focused, they have less capital than larger competitors, but that doesn't mean they're short on ambition and talent.

The goal

With near real-time intelligence, manufacturers can empower their people to make better business decisions and resolve problems faster to improve performance across the end-to-end manufacturing value chain. This is helping them to boost revenues, reduce operational expenditure and enhance customer satisfaction to become more competitive on the global stage.

The challenge

As many forge ahead, we see a striking tension between the desire for fast value and the reality of tackling AI fundamentals. Leaders can't ignore critical human considerations while ensuring that data and technology are set up for AI success. In this report, we delve into the gaps between the tough realities and bullish expectations for AI value.

The solution

It's vital to start with prioritized AI uses cases that will add real business value. Siloed IT/OT system data and a lack of robust governance processes remain major hurdles to success. The ability to unify, contextualize and democratize intelligence using industry standards, such as ISA-95, will be critical to accelerate manufacturers' journey to more autonomous operations.

Extensive global survey focused exclusively on mid-market organizations

Our insights in this report are based on research with 4,100 decision-makers across Australia, Brazil, France, Germany, Italy, Japan, Netherlands, Spain, UK, and US. Respondents worked in organizations with between $500M and $5bn global annual revenue and from a range of private and public sectors. This includes 500 leaders in the manufacturing and mobility industries.

SECTION ONE

What are the top AI value scenarios and entry points in manufacturing?

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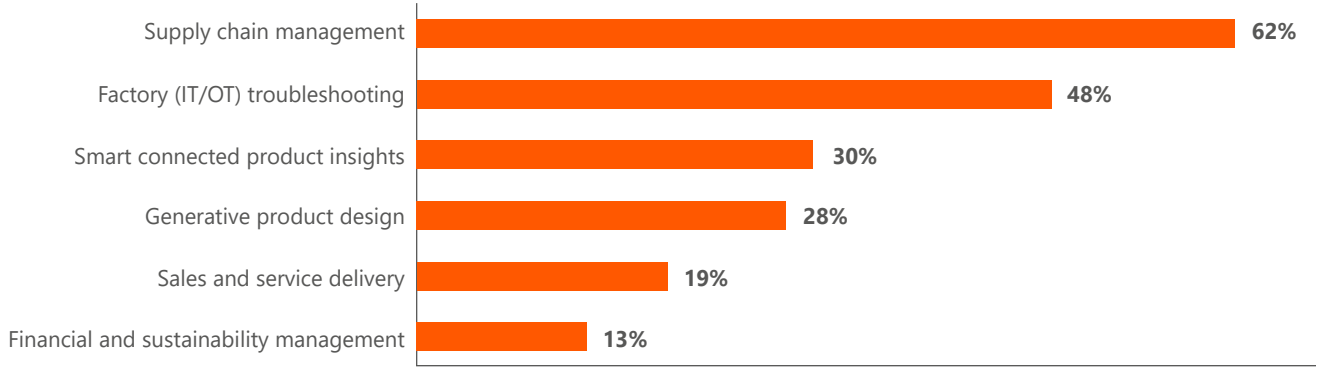
Manufacturers are welcoming AI to the team in every business function. Some 48% see the top AI benefits as improved processes, resulting in time savings and better decision-making. While 41% highlight opportunities for improved revenue growth as the key area of AI potential. A further 33% cite cost savings as the main AI advantage in competitive markets.

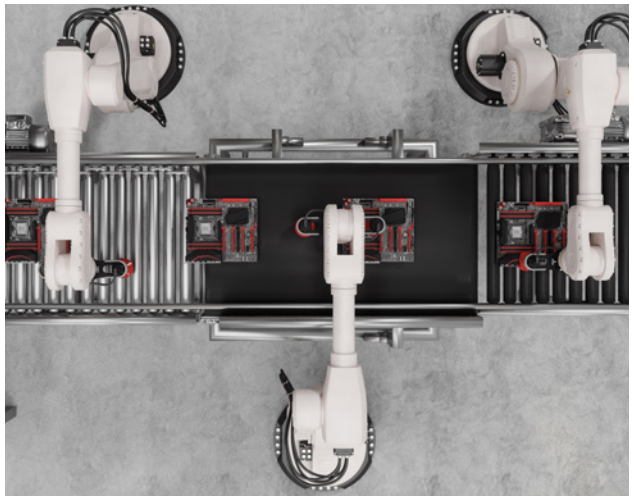
Transformational opportunities span the entire value chain. The top two investment areas are supply chain management (62%) and factory IT/OT troubleshooting (48%). AI helps firms tackle challenges like inflation, supply chain disruptions, trade wars, and labor shortages. It enhances efficiency, reduces costs, and improves decision-making by predicting demand, optimizing inventory, and automating processes.

"[We use] digital twin simulation technologies to define processes and optimize process flows. We identify bottlenecks and the right sequencing to do things and standardize— not only across different manufacturing channels in the same plant but also among the different plants in different parts of the world."

COO, Multinational Consumer Packaged Goods Manufacturer

What do you anticipate will be your top two areas of AI investment in 2025?





Intelligent supply chains

AI helps to optimize inventory, maximizing availability in manufacturers' retail channels and boosting sales. It enables them to evaluate suppliers for quality and cost efficiency, identify potential disruptions, and suggest alternatives.

Smart connected manufacturing

AI predicts equipment failures, detects quality issues, and supports faster troubleshooting. It also drives better simulation using digital twins to optimize performance and reduce waste and costs.

Intelligent products and services

AI analyzes data from connected products to drive more timely predictive maintenance interventions and enhance customer satisfaction. It is a key enabler of new service-driven revenue streams.

Digital design and engineering

AI accelerates R&D prototyping by generating multiple iterations and suggesting materials and enhancements that can reduce waste and costs while maintaining quality.

Digital sales and services

AI enhances personalized marketing to boost conversion rates, predict sales trends for better production and inventory planning. Beyond this, it can assist with automating responses to routine inquiries in customer and field services.

Financial and sustainability management

AI optimizes energy usage to cut costs and carbon emissions and enhances the accuracy of financial forecasts for better investment and budgeting decisions.

"I don't think companies can't afford to delay in implementation of AI tools or they're just going to fall way behind."

VP, Engineering, Automotive Tier 1 Supplier, US

4X

Up to 4X return is expected for every $1 spent on AI copilots and agents within 12 months

85%

believe they risk losing their competitive edge by not implementing AI quickly enough

Recommendation #1

Manufacturers should invest in AI for better processes, decision-making, and revenue growth, helping workers across functions gain a competitive edge with real-time AI and automation.

SECTION TWO

Manufacturers' most valuable asset in the era of AI is their data

But is their data ready for AI?

Despite the huge potential for AI, data management continues to be a problem.

74%

of manufacturers agree that poor data quality and governance inhibit AI acceleration

49%

are still being hindered by software compatibility issues

The picture is the same at mid-market manufacturers and global giants. Some 48% percent of CXOs said their organizations lacked enough high-quality data to operationalize their generative AI initiatives according to the recent Accenture Art of AI Reinvention Survey, 2024.

This is a particular concern for a few reasons:

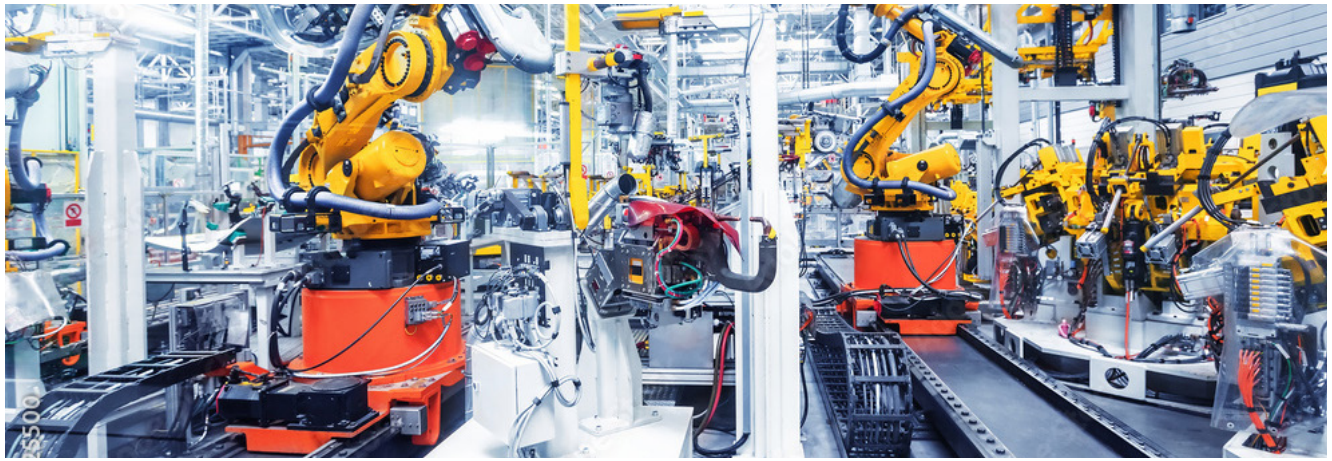
- Integrating AI with decades-old equipment in manufacturing plants can be challenging because these systems often lack the necessary interfaces and protocols for seamless communication.

- IT/OT silos and multiple proprietary data standards inhibit the ability of AI-enabled solutions to provide meaningful intelligence in near real-time.

Estimates suggest that 80% to 90% of data is unstructured. As a result, manufacturers are extending their data lifecycle management practices to include the large volumes of mixed-modality and near real-time data needed to optimize and customize Large Language Models (LLMs). This includes data from machine telemetry, maintenance logs, images and videos captured by computer vision applications (used on production lines for quality control and automated inventory management), technical documents and meeting transcripts.

"Manufacturers today collect a huge amount of data. But then we don't use this data. When we start to work with digital twins, we need to understand what kind of data we want to take out of our systems to make processes work better. It's really important to understand what you want to achieve and bring people on board. It's very difficult to change a culture inside a company when you're used to using paper and pen."

COO, Consumer Packaged Goods Manufacturer



Unstructured data provides a real-life, unfiltered representation of a manufacturer's business. It's also why nearly three out of four companies are leveraging complex, real-time, unstructured data from multiple sources according to the Accenture Art of AI Reinvention survey 2024.

Generative AI tends to be most useful when it's powered by a manufacturer's proprietary data. That's because AI foundation models that run on company data can better unlock high-value insights about that manufacturer's customers, products, processes, supply chain partners and operations.

"We want to remain competitive. If we don't [encourage experimentation and new ideas] while our competitors are doing so, we will be out of the market because our costs will not be sustainable. Our workforce is even more supportive when they understand what we want to do. They add real value in suggesting how to do things in the factory and what we should avoid doing."

COO, Multinational Consumer Packaged Goods Manufacturer

Historical and current institutional knowledge can improve in-the-moment decision-making and automation, reduce risks and identify new efficiencies, as well as open attractive monetization opportunities. As a result, manufacturers are fine-tuning existing generative AI models or developing custom models to accelerate business value creation. Indeed:

41% use AI in existing apps and tools

40% use custom AI apps and tools

17% use public AI apps and tools

Concerns about Intellectual Property (IP) protection, as well as supplier and customer data, persist. Firms are understandably cautious about supplying external generative AI solutions with business-critical manufacturing, purchasing and supply chain information. Strict data retention, privacy policies and trustworthy security guardrails are vital.

Recommendation #2

Manufacturers can unify data from IT/OT systems and contextualize and democratize intelligence with industry standards (e.g., ISA-95) to accelerate time to value with AI.

SECTION THREE

AI is already helping manufacturers move toward more autonomous operations

AI is already helping manufacturers move toward more autonomous operations

AI is helping manufacturers make significant strides toward more autonomous operations to enhance the efficiency, adaptability, and resilience of manufacturing processes. Autonomous systems allow machinery and processes to perform tasks, make decisions, and adapt to changing conditions with minimal human input, based on near real-time intelligence to optimize productivity across the value chain.

On production lines, for example, AI-driven equipment can automatically regulate factors like speed, pressure, and temperature, based on near real-time data, to maintain quality standards without manual intervention. This self-optimization improves product quality while lowering the likelihood of production errors.

Today, machines equipped with sensors and AI can also detect abnormalities, diagnose issues, and resolve or report them to operators. This capability reduces downtime, extends equipment life, and supports predictive maintenance—a crucial benefit as manufacturers contend with labor shortages and rising operational costs.

"[We're trying to use AI] that doesn't just detect effects, but is able to learn from what it sees and take decisions in unexpected situations.

We are looking at what we can do with AI [vision] when we need to deliver a pallet full of box of coffee that may have several non-compliance issues, in terms of a missing box, a damaged box, a box put in the wrong way, a box without a label or with the wrong markings."

COO, Multinational Consumer Packaged Goods Manufacturer

The journey towards autonomy is accelerating:

Just 5%
of manufacturers are not comfortable with AI making decisions autonomously today

26%
are comfortable with AI making potentially high-risk decisions autonomously

25%
are comfortable with AI making low-risk decisions autonomously

These figures illustrate both growing trust in AI and the need for clearer Responsible AI (RAI) frameworks to guide autonomous decision-making in complex environments.

Digital twins help to close data gaps: Intelligent AI collaborators simplify complex tasks

Digital twins—which are virtual models of physical systems—provide another layer of intelligence by simulating entire manufacturing or logistics systems in real-time using AI. These models incorporate near real-time sensor data, historical data, and insights from experts to create a comprehensive view of operations. For instance, in an automated warehouse, digital twins can simulate the responses to disruptions such as a stalled automated guided vehicle (AGV) or missing materials and equipment.

Digital twins help to close data gaps that often hinder a rapid, accurate response to unexpected events. With digital twins, manufacturers can anticipate issues, predict the next best action, conduct "what-if" scenarios, and validate AI-driven recommendations—helping to improve throughput, reduce waste, and minimize operational delays.

As manufacturers integrate these advanced tools, AI-powered agents will begin to act as "intelligent collaborators," taking on complex tasks like researching, planning, and recommending responses to anomalies. These agents will drive further autonomy by generating actionable insights and planning for unexpected changes, transforming AI from a reactive tool into a proactive partner.

Advanced autonomous systems use AI algorithms to make complex decisions without needing constant human oversight. For instance, robots in a manufacturing plant might decide on the best path to take for material transport based on near real-time traffic data within the facility.

Manufacturers are committing to continuous learning for AI systems, enabling adaptation to dynamic production environments and evolving requirements. Since products, processes, and demand fluctuate regularly, ongoing training is essential to keep AI models accurate and relevant.

"I do think [AI] has to be able to unlearn and forget because it's very likely to learn wrong things or inaccurate things, which we are already seeing in the commonly accessible AI right now."

Principal Program Manager, Industrial Manufacturer, USA

Recommendation #3

Manufacturers can use AI-driven systems and digital twins to boost business performance. Continuous AI learning drives adaptability and continuous improvements.

How can you gain the AI advantage in your business?

The rapid advancement in generative AI, multi-agent systems and cobots technologies has transformed possibilities in manufacturing. By unlocking the intelligence within traditionally siloed IT/OT systems with industry standards, like ISA-95, manufacturers can harness AI in all these forms to power real-time "ask-an-expert" capabilities and predictive insights for their employees.

ISA-95 provides a standardized framework for integrating enterprise and control systems. This standardization ensures that data from various sources, such as Manufacturing Execution Systems (MES), Enterprise Resource Planning (ERP) systems, and industrial automation systems, can be seamlessly integrated and understood.

Common terminology eases interoperability

By defining common terminologies and data structures, ISA-95 facilitates interoperability between different systems. This allows manufacturers to create interconnected data models"—or "graphs"—that represent various aspects of their operations.

A "graph of graphs" approach to knowledge management involves creating interconnected knowledge graphs that represent different domains within the manufacturing environment.

These graphs can include data on production processes, equipment, supply chains, customer orders and more. By linking these graphs, manufacturers can gain a holistic view of their operations, enabling better decision-making and optimization.

With a unified data model, manufacturers can apply advanced analytics and AI techniques to their data. This enables them to uncover insights, identify patterns, and predict outcomes more effectively. For example, they can perform root cause analysis, optimize production schedules, and improve quality control.

ISA-95 supports real-time data integration, allowing manufacturers to monitor and respond to changes in their operations promptly. This real-time capability is essential for maintaining efficiency and agility in modern manufacturing environments.

AI-driven insights streamline operations, enhance troubleshooting across complex systems, and enable manufacturers to scale efficiently in response to evolving market demands despite labor shortages in every geography around the world.

AI copilots and agents – what are they?

Copilot

An AI assistant that synthesizes information and responds to end-user prompts and requests.

AI agents

Provides AI assistant capabilities, but is also able to handle more complex workflows autonomously and automate processes.

Multi-agent systems

Multiple AI agents with specialized roles that work together to boost efficiency, adaptability, and problem-solving capabilities on the factory floor.

Machine coworkers

Cobots that combine the precision and efficiency of automation with human direction, creativity and problem-solving.

Gemba: part of lean manufacturing methodology

Avanade's free Gemba Walk program offers mid-market manufacturers the opportunity to pinpoint high-impact AI applications across their entire value chain—from digital design and engineering to sourcing, production, fulfilment and field services. This is a vital first step to take a pragmatic and focused approach to value creation with AI in all its forms.

"Gemba" means "the real place" in Japanese and is part of the "lean" methodology in manufacturing. This hands-on program places our experts directly within factory, warehouse, logistics or field services environments for either a half-day or two-day visit to assess and improve processes alongside your frontline workers and management team.

With insights from industry leaders and a tailored, practical approach, this program bridges the gap between theoretical AI possibilities and tangible business outcomes, helping you drive product and process improvements that enhance customer satisfaction, reduce costs, and generate new revenue streams.

To discuss scheduling a visit or to find out more, please visit **www.avanade.com/manufacturingcopilot** or email **manufacturing@avanade.com**

"I strongly advocate for the need for empty space in your schedule to foster creativity and innovation. To me, this is the power of AI. It allows people to spend more time on meaningful work that you are passionate about to make the world a better place."

VP, Engineering, Automotive Tier 1 Supplier, US

How we created this report

This report was created through collaboration by people across Avanade and select industry leaders. It combines inputs from primary research with our hands-on experience of AI on Microsoft across industry, technology, data, responsible AI, experiences, advisory, sales and marketing.

Survey methodology

Avanade commissioned independent market research firms McGuire Research Services and Vanson Bourne to undertake quantitative and qualitative research to understand the mid-market's experience in developing and implementing AI solutions and emerging technologies.

Across the two separate research projects, a total of 4,100 IT decision makers and senior business decision makers outside of IT were interviewed in August and September 2024, across Australia, Brazil, France, Germany, Italy, Japan, Netherlands, Spain, UK, and US. Respondents worked for organizations with $500M to $5bn global annual revenue in these industries: Banking, Consumer Goods and Services, Energy, Government, Healthcare, Life Sciences, Manufacturing, Nonprofit, and Retail.

The interviews were conducted online and were undertaken using a rigorous multi-level screening process to ensure that only suitable candidates were given the opportunity to participate.

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For additional information:
Avanade Trendlines full report

www.avanade.com/manufacturingcopilot

Avanade is the world's leading expert on Microsoft. Trusted by over 5,000 clients worldwide, we deliver reliable, AI-driven solutions that solve business challenges of all sizes and unlock the full potential of people and technology. We empower organizations to use Microsoft technology to optimize operations, drive growth, and foster innovation, enabling them to excel in delivering exceptional customer experiences.

Together with Accenture, we combine global scale with local expertise in AI, cloud, data analytics, cybersecurity, and ERP to create human-centered experiences. We are committed to doing what matters for our clients, their customers, employees and partners by designing solutions that prioritize people and drive meaningful impact.

Since 2000, Avanade has leveraged its close partnership with Microsoft to bring the latest technologies to market, serving as Microsoft's "Client Zero" and earning, with Accenture, Microsoft's Global SI Partner of the Year Award a record 19 times.

As a purpose-driven and responsible organization, Avanade champions diversity, inclusion, and sustainability, ensuring our work benefits society as well as drives business success.

Avanade. Do what matters. Learn more at www.avanade.com and follow us on LinkedIn.