THE AI-READY MANUFACTURER

PREPARING MANUFACTURING SOFTWARE

Technology Research Report

Prepared by Devox Software
https://devoxsoftware.com

January 2026

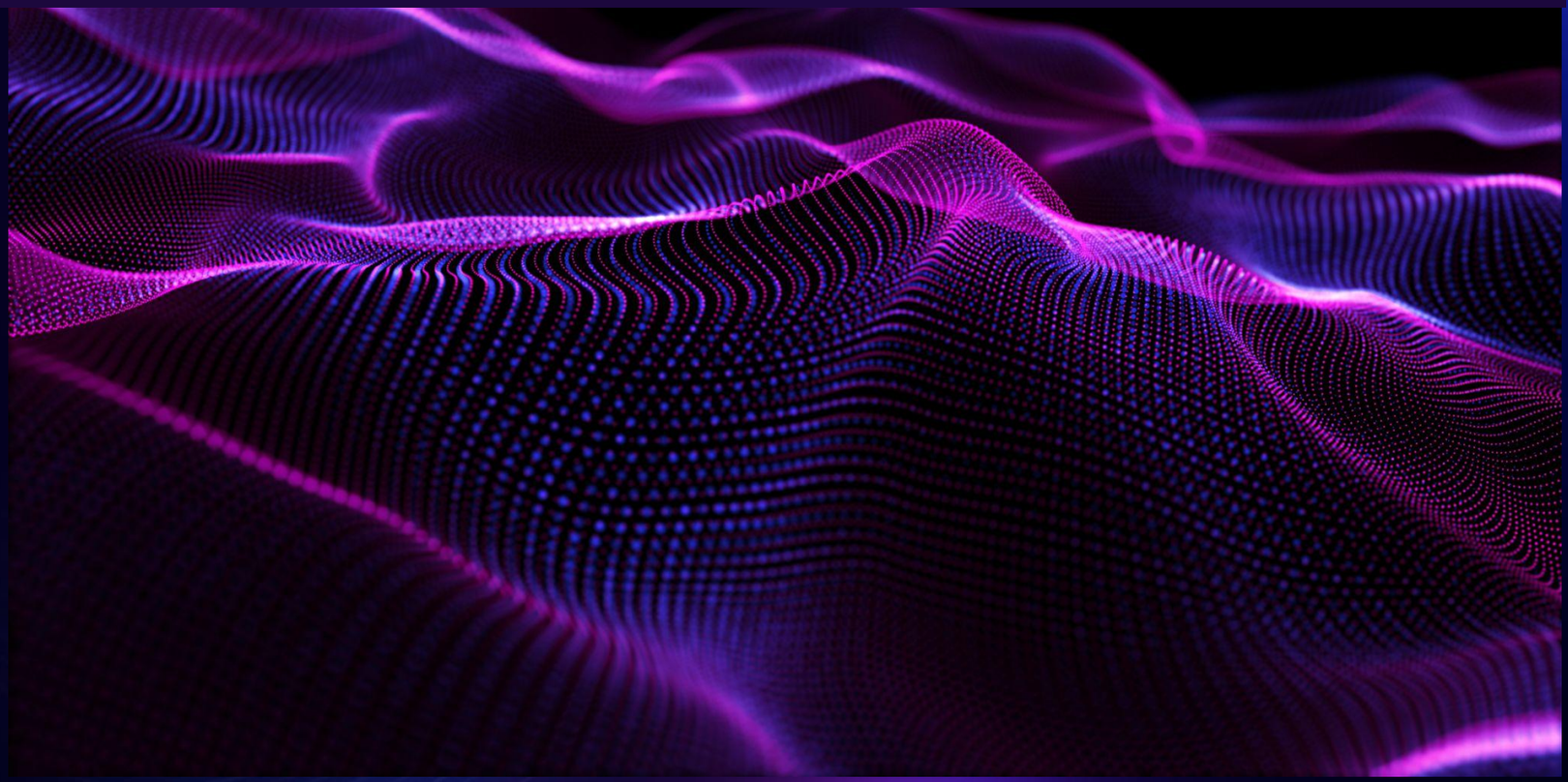
AI REVOLUTION IN 2026 FACTORIES

The question no longer is "Should we throw AI on the shop floor?" but "Is our existing software up to the task of supporting it in a real-world, no-holds-barred kind of way?" Shaky supply chains, trouble finding good workers, and thinner profit margins have all just sped up a shift that was already underway.

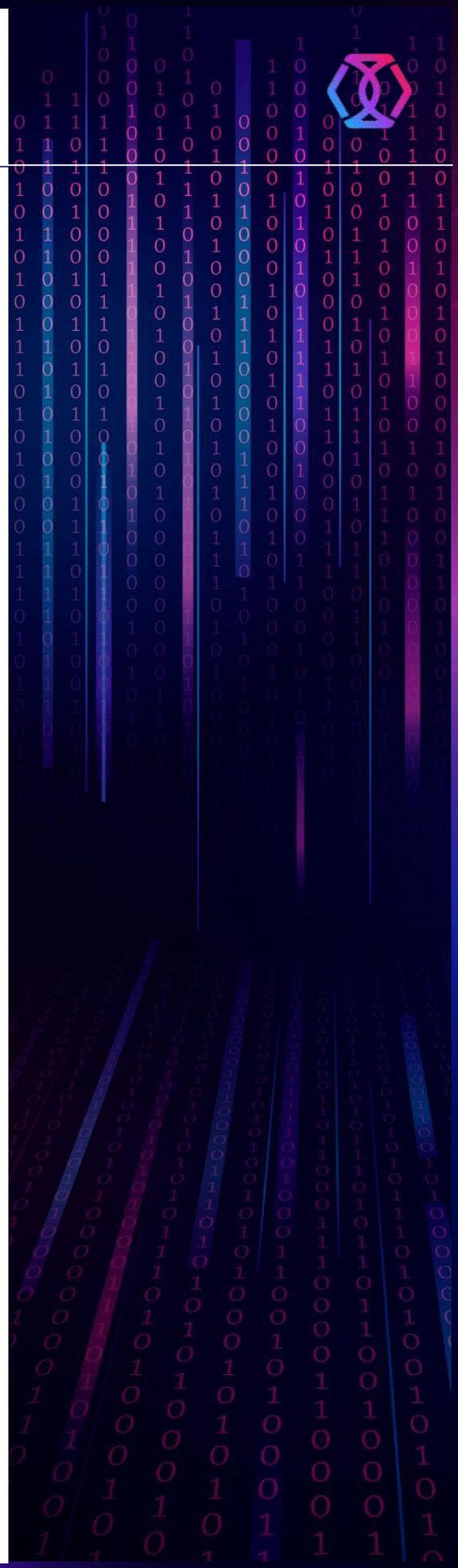
The main thing that kept progress from happening wasnt the AI itself, it was the foundation that it sits on. Most of the ERP, MES, and shop floor software we're still using was built to track transactions and report on progress, not to exchange data in real-time. This meant that many AI projects stalled before they ever reached production, as there was no way to get them to work without completely disrupting the core systems they relied on.

This report looks at how manufacturers made real progress on this problem by 2026. It's all about the dirty work of updating old software, getting reliable real-time data piped in, getting the infrastructure in place to keep everything running 24/7, and actually tying the AI projects to something that can be measured, like actual business results.

The problem here is a structural one, not just a matter of getting the right ideas. Companies that invested in software that was up to handling the demands of AI were able to get faster, more resilient, and able to turn all that fancy AI power into real production advantages. The ones that didn't were stuck with the same old problems because they were trying to slap new tech onto systems that weren't ever designed to handle it in the first place.



DECODING SOFTWARE FOR AI READINESS



- The market for AI has already reached a respectable 244 billion U.S. dollars in 2025, and experts predict it'll just keep growing from there.

- Artificial Intelligence (AI) agents and data are racing ahead on the Gartner Hype Cycle for AI, and by a pretty significant margin, according to Gartner. It’s a sobering thought to learn that 57% organizations believe their data isn’t yet ready for AI — a major obstacle to achieving business objectives through it.

- 49% of the organisations we looked at don't have a huge amount of confidence in their manufacturing strategy to deliver on business outcomes over the next three years either. Meanwhile, the Semiconductor industry managed to rack up over $400 billion in sales in 2025, and AI was one of the key drivers behind that.

- Chinese private AI investments totaled approximately $35 billion during the 2025 fiscal year. Despite the hype, 91% of mid-sized manufacturers are now using Generative AI, but most of them are struggling to get beyond the pilot phase.

- A massive 62% of companies we spoke to said that poor cross-functional collaboration was holding them back from getting the most out of AI, while a further 63% said they need to rethink their workflows if they want to make AI work in their business.

- By the way, Mckinsey show a striking paradox that nearly every company surveyed is investing in AI — yet only one in a hundred believes it is operating at peak performance.

OVERHAULING INFRASTRUCTURE FOR AI

With the demand for AI on the rise, Gartner is warning that energy demands will surge more than threefold by 2030, and that means we're in for a radical overhaul of the power and cooling infrastructure in our data centers.

To really make the most of this technology, enterprises need to get all their different teams working together to stitch together IaaS, PaaS, and SaaS systems to deliver AI-enabling solutions. At the same time, they should be building or getting involved in industry-specific ecosystems to develop smarter AI agents that actually deliver results.

While many leading software companies have embraced cutting-edge technology, few are truly prepared to meet the radical demands of the Gen AI era. To build the kind of products that are needed — the ones that involve real-time processing and autonomous agents working at a huge scale (they will require an entirely new infrastructure foundation), one that supports not only cloud and analytics capabilities, but also high-performance and real-time demands.

This kind of overhaul affects two core areas: the company's value proposition and its internal operations. So, that means totally rethinking the products, business models, and sales and marketing approach from the ground up, as well as fundamentally changing how the company operates, which involves scaling AI right across the internal workflows and building the right infrastructure and cultures to get really big productivity gains.

As AI moves from experimentation to active business use, infrastructure decisions become a critical factor in overall business success. Unlike the traditional refresh cycles for infrastructure, the decisions about AI infrastructure are going to be squeezing timelines and making trade-offs even harder.

CIOs need to incorporate model governance, stress testing, and disaster response protocols into their infrastructure plans. And one of the key things they need to do is treat AI resilience as a core infrastructure requirement, not an afterthought, if they want to be trusted and compliant.

MASTERING DATA

Without having solid data you can work with, organizations are unlikely to achieve their business goals & they're also going to leave themselves open to significant risks. 57% of businesses say their data isn't yet ready for AI.

53% percent of the time, organisations don't actually know whether they're doing data management right for AI or not. But it all comes down to the fact: organisations just don't have the right skills or the right info on their data to figure out if it's up to the job for AI.

To effectively manage metadata, organizations must first organize their technical metadata and then expand from there to get some real business context. Identifying gaps, quality issues, and cost inefficiencies in data is critical to making meaningful progress in AI initiatives.

Assessing available data and evaluating its suitability for AI projects is an essential step.

Maximising the value of data for AI requires datasets to be aligned with the AI tools in use, resulting in stronger outcomes and improved financial performance.

At present, data value is best demonstrated by assessing its fitness for a specific AI use case.

The presence of appropriate expertise, supported by suitable technology and data infrastructure, is crucial to achieving meaningful returns from AI initiatives.

NAVIGATING AI RISKS AND ETHICS

In general, 51% of respondents from organisations that are already making use of AI are telling us they've seen at least one negative consequence arise, while nearly a third of all respondents say they're seeing issues with AI being just plain wrong. And the stats are pretty alarming: already 80% of orgs say they've encountered some dodgy behaviour from AI agents, including exposing data where it shouldn't be exposed, and getting access to systems that they shouldn't have access to.

57% of orgs reckon their data isn't even AI-ready yet, which is pretty concerning. If they can't get their act together and deliver on their business objectives, theyre basically leaving themselves wide open to all sorts of unnecessary risks. In his book Superagency, Hoffman makes the point that as we develop new capabilities, new risks will inevitably follow, so we need to be on top of them, but that doesn't necessarily mean we need to get rid of them altogether.

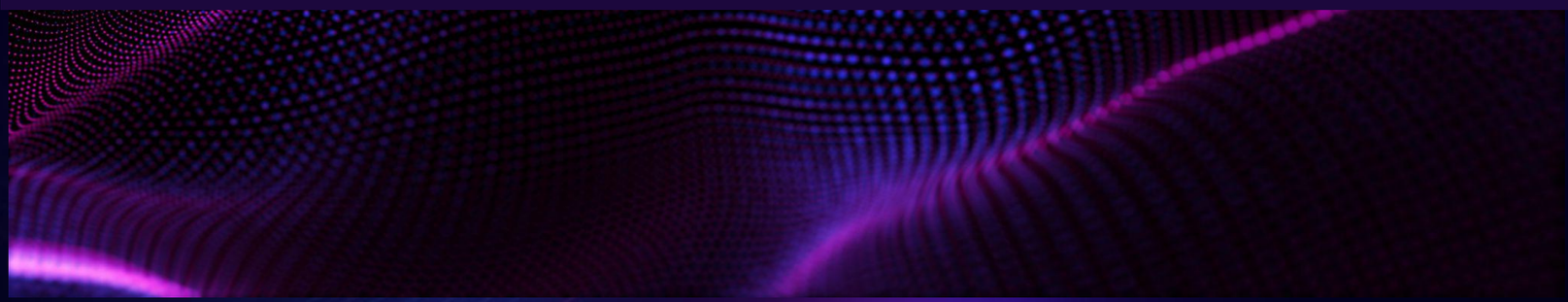
Existing AI risk programmes, including the whole ethics and cybersecurity aspects, really need to be updated if organisations are to make the most of AI without losing their shirts or damaging the people they impact.

Maintaining human oversight of AI is essential, especially now that we're starting to see agentic AI, which can do all sorts of complex tasks without much supervision.To get around this, orgs should be augmenting IAM with some guardrails to stop agents from being misused or triggered into doing something bad by a tricky prompt or objectives that aren't aligned.

This is all part of the shift in productivity that's also opening up a whole new set of risks. Insider threats can take the form of a rogue AI agent capable of causing significant damage, whether it's hijacking goals, misusing tools, or escalating privileges so fast it's hard for people to step in.

If orgs don't get a move on, they're looking at serious legal, reputational, organisational, and financial risks on the line. And then there's the added complication of multi-agentic workflow,s which just creates an even bigger risk of hallucinations. Not to mention that AI tools do expand the threat surface and create new security vulnerabilities for orgs to deal with.

It's interesting to note that despite all these risks, 71% of employees actually trust their employer to do the right thing when it comes to developing AI.



UNLEASHING ROI IN AI MANUFACTURING

It was a banner year for AI in supply chain management, too, with many leading manufacturers seeing returns exceeding 20% from their investments in 2025.

Manufacturing firms that adopted AI early recorded an average ROI of 22% for the full year 2025, driven by predictive maintenance and supply chain optimisation. Automation in manufacturing using AI provided the average manufacturer with an 18% efficiency boost across key metrics in 2025.

In terms of quality control, companies that invested in AI successfully reduced defects by 25% over the course of 2025. The global market for AI in manufacturing closed 2025 with $15 billion in revenue, delivering an average ROI of approximately 19%.In a pretty surprising trend, 91% of manufacturers who were using generative AI were seeing a measurable boost to their 2025 operations.

US firms that added AI into the mix on their production lines saw a 17% bump up in ROI in 2025. And according to Bloomberg, the fact that the whole manufacturing industry was going digital in 2025 helped get the AI ROI in manufacturing up to a pretty healthy 21%.
Mechanical engineers were also raving about a 16% ROI boost they got from using AI tools in their design processes in 2025.

Companies that have adopted supply chain AI were able to save a pretty big chunk of cash (we're talking 23%) by streamlining their logistics in 2025.
The final data for 2025 shows that the ROI on AI in manufacturing workflows globally reached a peak of 24%.

VISIONING FUTURE AI TRENDS

Artificial Intelligence & AI-ready data are the 2 fastest developing technologies according to the Gartner Hype Cycle for Artificial Intelligence, Gartner says. And it's no surprise really: at the manufacturing end of things, generative AI can unlock a whole lot more productivity by spotting problems before they happen and dramatically reducing defects on the production line, then using that data to write plain-English work instructions that are easy to follow.

As we enter 2026, firms are no longer merely dabbling with AI; the evolution toward Agentic AI has forced companies into a race to keep pace with autonomous automation. One of the major trends you can expect to see is the integration of AI with robotics, plus the rise of collaborative robots (which we all know as cobots) and the start of Cloud robotics that can just work on its own without needing direct human input. Roland Berger, a consultancy firm, reckons industrial automation equipment sales will see a pretty decent rise in growth over the next couple of years: 3-4% in 2026, then up to 6-7% for the remainder of the decade.

America's industrial heartland is just about to get a major AI injection, which is a pretty big deal, and shows just how much the economy is being transformed, or even kept on its feet, by the huge investment being made in software, chip-making, and data centres
Manufacturing and automotive supply chains are starting to shift towards AI-first operations, but to really scale, you need good, clean data, standardised processes & some decent governance. One of the things we can expect to see in 2025 is even more integration of AI & machine learning into CAD/CAM systems.

Companies that optimise their supplier networks can end up with better product quality, lower costs & quicker delivery times, and AI tools can help them mitigate some of the risks, like supplier disruptions or quality issues.

According to a McKinsey survey of Manufacturing COOs, the AI hopes are pretty high & the budgets are fairly large, but some companies may be underinvesting in the resources needed for AI to deliver long-term value in the long run.
In a relatively short amount of time, technology is going to stop being the only thing holding back lights-out factory transformations, meaning the factory can operate fully autonomously without human presence.

Thanks to the tech developments in language models, computer vision, sensors & the simple fact that hardware is now a lot cheaper, AI is getting close to being a reality on the shopfloor, in logistics & in service jobs.

BLUEPRINT FOR AI INTEGRATION

Based on Devox Software's hands on experience in delivering production grade AI systems to small and medium businesses and fast growing manufacturers, this blueprint is designed to show you a practical way to get AI embedded into your factory floor, without destabilising, or over engineering the system.

1

System & data baseline

First you need to know what you've got: your current ERP, MES, SCADA and shop floor systems. You need to understand what data you've got, where the gaps are and what's stopping you from getting the most out of your systems. So set some basic metrics.

2

Unpicking AI use-cases

Next you need to define what AI is going to do for you. What are the specific AI use cases you need? Predictive maintenance? Quality inspection? Demand forecasting? Prioritise them.

3

Data readiness layer

You can't do AI without good data, so sort out the governance, cleansing and labelling of your data. Store it safely and securely. And make sure you can get real-time and historical data from your shop floor into the system.

4

Choosing the right model

Now you need to pick the AI tools that work best with what you've got. Choose the ones that talk easily to each other through APIs and modular services. Tools that have been tested in real world environments are the best bet.

5

Phased deployment

Start with the simple stuff: introduce AI into your lower risk processes first and use iterative delivery and automated testing to make sure it all works as it should.

6

Continuous improvement

Keep an eye on how your models are doing, how stable the system is and your business KPIs after you go live. Retrain your models as things change and scale your infrastructure up as needed using containerisation and automation.

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