

INNOVATION BRIEF

Tomorrow's AI-Powered Manufacturing CX

Always one step ahead



WRITTEN BY

Diana Wu David
Director of Futures

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Summary

- Manufacturers' traditional approach to customer experience (CX) is too reactive and fragmented to navigate rising customer expectations and a volatile operating environment successfully.
- Modern technologies, like AI-powered CRM and spatial intelligence, are opening the door to a new approach to customer experience in manufacturing.
- The future of manufacturing CX will be predictive (identifying needs before they become problems), proactive (linking insights to action), and personalized (tailoring every interaction to individual customer context and goals).
- This dynamic, anticipatory, AI-driven approach to customer experience will enable tomorrow's manufacturers to foster a more meaningful and durable trust with customers, serving as a competitive moat in a rapidly changing and uncertain world.



In recent years, tariffs, extreme weather events, a global pandemic, and geopolitical conflicts have shaken the global manufacturing sector into a heightened state of unpredictability. Supply chains have fractured, delivery timelines have stretched, and costs have become volatile. B2B manufacturing customer expectations around speed, transparency, and service have collided with operational realities that companies can no longer fully control.

These forces exposed what many manufacturing leaders already suspected:

Traditional customer experience models across procure, configure, order, receive, and service that focus on linear, static journeys are no longer suited for the world manufacturers now operate in.

Even as factories have become smarter and supply chains more automated, the customer relationship often depends on outdated workflows, reactive service calls, manual investigations, and after-the-fact problem-solving. The contrast can feel almost absurd, like George Jetson ordering his flying car from a fax machine.



Modern technology is offering a new path forward. The future of customer experience in manufacturing lies in leveraging new technology to exceed customer expectations through intelligent, anticipatory engagement, addressing problems and needs before they arise. Instead of today's reactive and disconnected customer experience, tomorrow's CX will be predictive, proactive, and personalized, ultimately leading to a more meaningful, durable trust between customers and manufacturers.

Moving toward a customer-first future

Customer experience is typically associated with B2C companies. Yet both B2C and B2B customers expect experiences that value their time and relationship, understand their preferences, align with the best-in-class experiences across every industry, and surprise, delight, and even "wow" in the moments that matter.

However, the race to automate in manufacturing has too often come at the expense of customer experience. Many automation programs focused on plant efficiency and back-office cost cutting without redesigning the end-to-end customer journey, resulting in customers experiencing slow confirmations, opaque lead times, and poor issue resolution. Disconnected systems made promises difficult to keep. Quotes didn't match product realities. Service teams lacked visibility into

An outdated, reactive, and fragmented customer experience is at odds with today's customers' expectations and technological developments. Customers expect the apps, websites, customer service interfaces, and



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Thanks to advancements like AI, physical AI, sensors and IoT, and data personalization, B2B can rival the best B2C experiences and create opportunities to win and retain customers in moments of truth.

contract data. At the same time, customer expectations have skyrocketed in today's AI-first world, yet automation and business-as-usual have left customers feeling disconnected and underserved.

other technology they interact with to be intuitive, modern, native, and effortless. B2C companies are already leveraging AI to meet these customer expectations with more responsive, personalized CX. It's not surprising that customers expect the same from the manufacturing industry.

Manufacturing customers want a seamless front-end experience that is fast, transparent, visible, personalized, and consistent across channels. And they expect advanced operational systems behind the scenes that are proactive and predictive, ensuring uninterrupted service. Thanks to advancements

like AI, physical AI, sensors and IoT, and data personalization, B2B can rival the best B2C experiences and create opportunities to win and retain customers in moments of truth. For manufacturers, business as usual and legacy systems will not provide the B2C-level experience customers increasingly expect. Failing to meet these expectations is a surefire way to erode trust.

Capitalizing on new technology

Given evolving customer expectations, what can manufacturers do? New technology is offering a path forward in designing customer experience for the future. Three major technological developments will inform tomorrow's manufacturing CX:

1. Enterprise intelligence at scale

Enterprise data has traditionally been scattered across disconnected systems and siloed departments. The power of AI is driving home the limitations of a fragmented enterprise and the enormous possibilities of AI-first business operations. When all of a company's data and systems are connected and infused with intelligence, leaders gain continuous visibility into operations, customer health, supply chain dynamics, and emerging risks. AI synthesizes signals that humans would never connect on their own, such as correlating a dip in customer sentiment with a supplier delay or linking equipment performance trends to warranty exposure.

The result is an organization that doesn't just collect data, but actually thinks with it. Service can stop looking like a chain of manual handoffs and start behaving more like a coordinated system, where AI interprets signals, prioritizes work, and allocates resources without waiting for someone to intervene.

2. Customer Relationship Management

AI is transforming Customer Relationship Management (CRM) from a passive system of record into a unified system of action that connects data, workflows, and teams across sales, marketing, and service, and manages the customer lifecycle. Tomorrow's CRM will not be something employees log into.¹ It will be an adaptive engine on a single platform that predicts customer needs, analyzes asset health, schedules interventions, and orchestrates service outcomes across the full lifecycle.²

As CRM becomes more intelligent, proactive, and comprehensive, it will extend all the way to the supply chain and the factory floor. In other words, AI-powered CRM will enable manufacturers to identify customers at risk of churn, which machines are likely to fail, or which accounts are primed for expansion, and act before it's too late.

3. Spatial intelligence

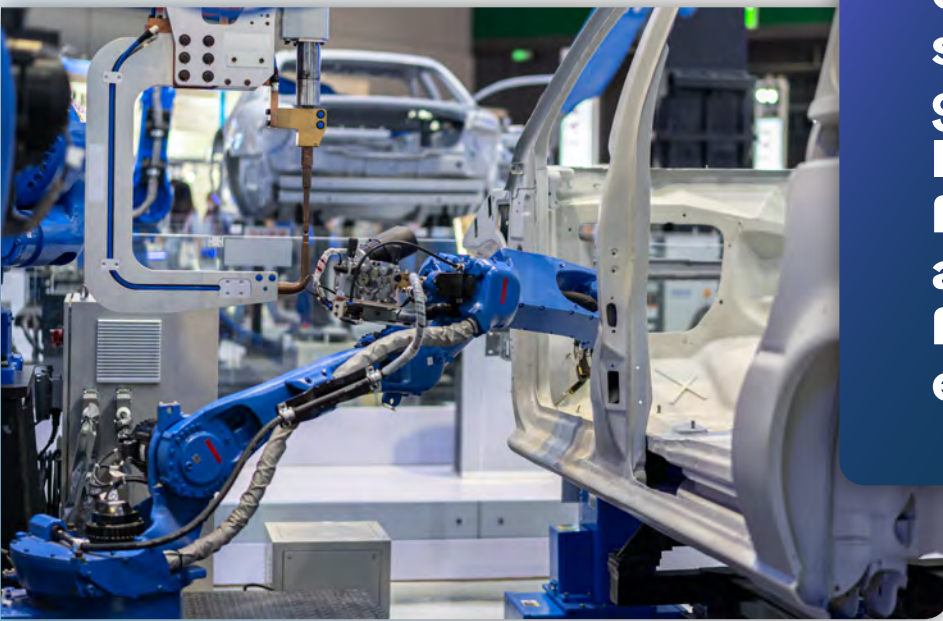
Thanks to AI, spatial intelligence in the manufacturing sector is evolving from knowing where things are to continuously

understanding, predicting, and acting in 3D space with human-like context and intent. Digital twins are enabling manufacturers to simulate environments, test operational changes, and validate system behavior at near-zero marginal cost.³ Physical AI is training robots within massive synthetic environments, producing machinery capable of navigating dynamic and unpredictable tasks.⁴ Advances like these will dramatically increase production

facilities, thereby speeding up the fulfillment of existing and future products.

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In a future where manufacturers can deploy enterprise intelligence at scale to power a new generation of CX and leverage connected data from customer social media activities all the way to the factory floor, customer experience transforms.



capacity and reduce the time needed to design, test, and optimize factory floor layouts or product development cycles.

Spatial intelligence will not only redefine how factories operate; it will also generate new data streams that exponentially enhance AI-informed customer experiences. For example, spatial intelligence will enable manufacturers to match customer requests with machines that have available uptime and test the investment required for new production

The future of manufacturing CX

All three of the above technology developments are creating opportunities for future-focused manufacturers to reimagine the customer experience in an AI-first world. In a future where manufacturers can deploy enterprise intelligence at scale to power a new generation of CX and leverage connected data from customer social media activities all the way to the factory floor, customer experience transforms.

CX in AI-enabled manufacturing creates a human-centric framework that encompasses all interactions, perceptions, and value exchanges between manufacturers and their B2B customers across the entire lifecycle—from awareness and co-design to production and delivery to service and post-sale support.

An AI-powered manufacturing customer journey will be automated and augmented by intelligent systems that include predictive AI, physical AI, humanoid robots, and integrated

sales, service, and support platforms. These technologies will unite customer workflows, data, and security to make customer experiences not only seamless but also predictive and preventive. Think of manufacturers that anticipate equipment failures and prevent downtime through proactive service, or those that recognize when systems are reaching capacity and deliver timely sales offers to help customers scale at the right moment.

Tomorrow's AI-powered customer journey

Technology will enable manufacturers to innovate across CX touchpoints,⁵ including:

Pre-purchase:

- AI-powered product configurators
- Digital twins for simulation
- Predictive analytics for demand forecasting
- Personalized pricing engines

Purchase/co-creation:

- Customer input incorporated through customization and personalization
- Human input influencing design and production
- Differentiation between customized products with modular, predefined options and personalized products tailored to individual needs

Production:

- Real-time production visibility
- Quality assurance via AI vision systems
- Predictive maintenance to ensure on-time delivery
- Physical AI robots for flexible manufacturing

Delivery/service:

- Autonomous delivery systems
- Humanoid robots for installation support
- AR-assisted maintenance guidance
- Predictive service interventions

Post-sale:

- AI-powered customer support chatbots
- Continuous product monitoring via IoT
- Proactive maintenance scheduling
- Customer feedback loops for continuous improvement



The future of manufacturing CX is:

1. Predictive

Unified enterprise intelligence at scale can enable manufacturers to identify customer needs, equipment failures, and service requirements long before they become a problem for a customer.

Manufacturing relationships are complex and challenging to manage, spanning sales, service, parts, engineering, and finance. An AI-powered CRM will synthesize interactions across all these touchpoints, creating a real-time picture of a customer's experience, sentiment trends, and what matters most to them. And this holistic view will better predict and detect issues, flagging early warning signs of customer dissatisfaction.

Even predictive maintenance is vital to enhancing the customer experience. Paul Lee, President of the Asia Pacific Region at Spirax Sarco, notes how his teams can monitor steam systems remotely and spot problems at the earliest signs of drift. By the time a customer notices something is off, the system has already flagged it and prompted the appropriate action. That kind of early insight not only protects uptime but also creates space for new efficiency gains that customers might never have uncovered on their own.⁶

For example, General Motors implemented predictive maintenance systems that successfully predicted over 70% of

equipment failures. The systems provided technicians with up to 24 hours' notice for maintenance planning, dramatically reducing unplanned downtime and optimizing technician labor.⁷

Rolls-Royce revolutionized aerospace maintenance through its IntelligentEngine program, which combines AI with IoT sensors that continuously stream data to a cloud-based analytics platform. AI algorithms monitor engine health in real time, predicting maintenance needs in advance and preventing in-flight disruptions.⁸



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The entire operation starts to run with a kind of quiet intelligence that customers feel even when they don't see it.

2. Proactive

Insights alone are powerful, but tomorrow's manufacturers will link insights and actions to dramatically improve operations and service. Today, actions are triggered by customers noticing problems, placing orders, or requesting

support. Instead of waiting for customers to raise their hands, tomorrow's manufacturers will utilize intelligence embedded throughout the operation to identify opportunities early and tailor every interaction to the outcome the customer is trying to achieve.

For example, a heavy equipment manufacturer could monitor usage patterns and automatically trigger shipments when inventory levels are low, ensuring that customers never face production delays because they forgot to reorder filters or lubricants. Likewise, the AI-powered CRM system, continuously monitoring customer sentiment, could alert a rep to rush a shipment if a VIP order is at risk.

Insights can also power proactive communication, promoting visibility and transparency. For example, a customer could be alerted that an approaching weather event might affect their equipment or that a part they rely on is being phased out, giving them ample time to plan.

This is the heart of the AI experience. Maintenance becomes predictive, then



autonomous. Logistics stop reacting to disruptions and instead reorganize themselves before delays cascade. The entire operation starts to run with a kind of quiet intelligence that customers feel even when they don't see it.

Lou Simon, Chief AI Officer at Uptima, pushes the idea even further. He imagines a factory where no one sends a request for pricing or availability because the system already knows what is needed, negotiates with suppliers, and lines up the next steps. Intelligent Configure, Price, Quote (CPQ) systems are already integrated into a manufacturer's customer platform, service operations, and connected assets. As a result, they will be able to predict needs and price availability, delivering personalized offers when needed or even

before customers realize they're needed. At the same time, service becomes something that happens in the background, not a task someone has to manage.⁹

This leap is not just technological; it is experiential. The factory becomes a dynamic living environment where data, AI agents, and customer expectations co-create value, transforming customer experience and outcomes.

Though predictive CPQ is on the horizon, the building blocks and platforms already exist for forward-thinking manufacturers to put in play. For example, Ford adopted dynamic pricing in the automotive industry to adjust prices in response to supply chain disruptions. This strengthened margin stability and helped Ford

maintain competitive positioning during shortages. Additionally, they implemented proactive communication strategies to address customer concerns about price volatility to maintain relationships and manage expectations.¹⁰

3. Personalized

Rather than treating all customers equally, AI enables manufacturers to tailor communications, recommendations, and service levels based on individual customer patterns and preferences—something previously impossible given the volume and complexity of B2B manufacturing relationships.

Tomorrow's CPQ systems won't function as standalone tools that sales reps open when it's time to build a proposal. There will be an always-on intelligence layer that informs how the manufacturer engages with a customer throughout the buying journey. As a result, a manufacturer will analyze each customer's production volumes, product mix, maintenance history, and operational priorities to deliver recommendations tailored to their specific context, rather than generic suggestions based on broad industry averages.

Marketing communications will shift from mass campaigns to targeted outreach so that

customers expanding into a new product line receive information about compatible equipment upgrades, while those focused on sustainability receive insights on energy efficiency improvements. And rather than waiting for customers to request quotes, manufacturers will push timely proposals when signals indicate readiness, like a lease expiring or a regulatory change requiring upgraded capabilities.

In practice, this means customer value stops revolving around the product and starts revolving around continuous performance that reaches all the way to the factory floor. So, a pump, a robot arm, a packaging line, and an AI



agent all become part of a living system whose health, efficiency, and output are constantly optimized in the background in service to a customer in the foreground. AI agents watch for emerging patterns, coordinate the right interventions, and trigger service activities long

before a human notices anything is wrong. The customer experiences fewer disruptions, not because they were handled efficiently, but because they never fully materialized.

As this intelligence layer matures, the nature of interaction changes. A CRM system is not a place where someone logs notes; it becomes an autonomous participant in the customer lifecycle. It interprets signals from equipment, supply networks, environmental conditions, and usage patterns and then acts on them. It can schedule a technician, reorder consumables, or alert a customer to a looming risk without waiting for a workflow to be kicked off manually. It can identify opportunities for improvement and potential new products to prototype. The relationship shifts from a series of touchpoints to an ongoing conversation between AI systems working on behalf of both sides.

This approach also changes how people work. Human expertise does not disappear; it moves to a different altitude. People step in when judgment, creativity, or context is needed, not when routine coordination bogs them down. They spend less time triaging and more time designing better service strategies, new product options, or improving customer outcomes. Manufacturers that embrace this balance of human and machine capability end up with teams that are more capable, more informed, and far more trusted by their customers.





The Future of Manufacturing Customer Experience

An AI-first approach

This description of the future of manufacturing CX might sound jarring, given the very linear way it has traditionally been treated and the slow-moving, reactive way it often operates today. But this future is on the horizon, and the first movers will have a distinct advantage. The first steps toward tomorrow's CX can also be tackled in phases:

1. Data must be unified. Predictive, proactive, and personalized experiences are

only possible when all data is connected to power insights and action. Update your data audit to consider how AI may change how and where you pull data and how it interacts.

2. AI must operate across silos and customer-centered workflows. Intelligence confined to a single department cannot deliver the holistic insights or unified customer experience that customers increasingly expect. The time and cost it once took to share insights across departments can drop dramatically with AI,



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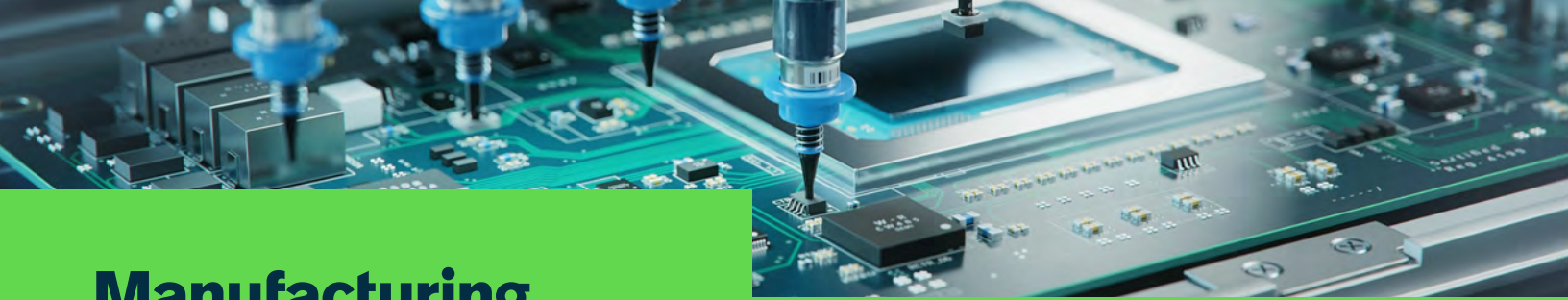
In an AI-first future, trust becomes a continuous operating system that underlies every interaction, every prediction, and every intervention.

enabling new ways to collaborate and serve customers. As you rethink customer value, cast a broad net in terms of what other departments might be involved.

3. Service, engineering, and operations teams must work toward the same

performance goals. Technological alignment must be accompanied by operational alignment across all teams.

As manufacturers work to reimagine CX, their north star must be trust. In today's manufacturing relationships, trust is episodic. It's earned through years of kept promises and tested during moments of crisis. But in an AI-first future, trust becomes a continuous operating system that underlies every interaction, every prediction, and every intervention. Competence, communication, and compassion are now elements of trust that customers expect and technology supports. Following the above steps and building tomorrow's CX can enhance each of these elements of the trust equation.



Manufacturing CX in 2032

A global industrial equipment manufacturer begins its day long before any human clocks in. AI agents embedded across its factories have already sensed a typhoon forming near a key supplier, rerouted component orders to an alternate region, and updated every affected customer with revised delivery windows—before anyone even knew a storm was coming.

On the shop floor, digital twins simulate thousands of production sequences overnight, automatically reconfiguring lines to match real-time demand signals and available machine uptime. A customer in Germany receives a notification that her packaging line will exceed energy-efficiency targets this quarter because an AI maintenance agent detected micro-vibrations in a critical motor and dispatched a technician days before failure. Meanwhile, a sales engineer in

Chicago collaborates with a customer on a new product concept, sketching it on a tablet as an AI CAD agent instantly generates manufacturable prototypes.

Every interaction feels anticipatory, transparent, and deeply personalized—not because humans are working harder, but because intelligence is woven through every asset, workflow, and relationship. The manufacturer's competitive edge is no longer just operational excellence;



it's the customer's growing sense that their partner is always one step ahead.

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This will be a fundamentally different way of showing up for customers, one where intelligence is embedded everywhere, problems surface earlier, solutions and new options are coordinated automatically, and customers feel like the manufacturer is always one step ahead rather than one step behind.

The CX foundation of trust

Predictive, proactive, and personalized are at the heart of tomorrow's approach to customer experience. The future of manufacturing cannot be defined solely by more automation or smarter tools. This will be a fundamentally different way of showing up for customers, one where intelligence is embedded everywhere, problems

surface earlier, solutions and new options are coordinated automatically, and customers feel like the manufacturer is always one step ahead rather than one step behind.

The feeling of being understood, anticipated, and valued is what ultimately builds trust. Trust in B2B manufacturing has always been hard-won. It accumulates through years of kept promises, reliable equipment, and responsive service when things go wrong. But it can erode quickly when customers feel like an afterthought, when they have to chase down answers, repeat their history to every new contact, or absorb the cost of failures that could have been prevented.

The AI-driven future described here inverts that dynamic.¹¹ When a manufacturer predicts and prevents a failure before the customer even notices, that's trust. When a proposal arrives at exactly the moment a customer is ready to expand, reflecting their specific needs and history, that's trust. When service feels seamless because every team shares the same view of the customer and works toward the same goals, that's trust. These aren't isolated moments but rather the cumulative effect of an organization that has aligned its technology, data, and people around the customer's outcomes.

In a world of volatility and uncertainty, trust is a competitive moat that no product feature or pricing strategy alone can match. Establishing and maintaining trust in tomorrow's AI-first world requires manufacturers to go all-in on a customer-driven approach to operations and service.

Endnotes

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