Deploying agentic AI at scale

Embrace AI innovation and elevate your smart manufacturing journey

Rapidly growing interest in both smart manufacturing and digital transformation initiatives is leading the manufacturing industry toward wider, early-stage AI adoption. Building on the momentum of 2024, manufacturers are expanding their AI investments and setting a firm foundation for future enterprise-scale AI deployments.

With an ongoing focus on operational efficiencies and productivity enhancement in 2025, firms are looking to AI to enhance the customer experience, improve employee productivity, and streamline decision-making.

73% of manufacturers are experimenting with either AI-based machine vision or predictive maintenance.[1]

80% of manufacturers are currently using generative AI or are experimenting with it.[1]

While AI is growing and finding wider use cases, the manufacturing sector is moving from experimentation to practical deployment, continuing to make it an investment priority. Being able to implement AI at enterprise scale — where specialized AI computing infrastructure can quickly deploy new agentic solutions — remains a challenging proposition. The complexity of integrating AI with current systems, along with maintaining data security, continues to slow deployments, as do high implementation costs.

29%

29% of manufacturers are making AI an investment.[2]

With so much potential value for AI to unlock in their organizations and operations, manufacturers need to move quickly — and carefully — when exploring their options. Having a strategic roadmap for AI deployment and the right resources and expertise in place can help ensure AI projects are implemented on time, within budget, ready to deliver ROI with enhance productivity.

Lenovo | **NVIDIA**

A smarter way to optimize operations and drive growth

Lenovo Hybrid AI Advantage™ with NVIDIA enables manufacturers working with **Lenovo AI Services** experts to build computing infrastructure to support the entire AI lifecycle and improve manufacturing operations, launching a new era of agentic AI at a faster pace and with reduced complexity.

Lenovo AI Library
Suite of ready-to-customize functional and vertical AI agents and AI assistants

+

Lenovo AI Services
Discovery
Advisory
Fast Start
Deploy
Managed
aaS

+

Lenovo Validated Designs, ISVs & Partner Ecosystem

NVIDIA Enterprise AI

OS Options
Red Hat Enterprise Linux · ubuntu

Management & Orchestration
XClarity · ONTAP 9 · kubernetes · RED HAT OPENSHIFT

Compute
(up to 5 scalable units)
Inferencing · Agentic · Training · Edge

Networking
NVIDIA · CISCO

Storage
NetApp · WEKA · ddn
Lenovo DM & DG Series

Lenovo AI Factory

NVIDIA's AI Enterprise has been integrated into modular Lenovo Hybrid AI Advantage™ solutions to meet customers where they are on their AI journey with speed, ease, and expertise.

Increase productivity
Enable teams to achieve more quickly with functional and vertical AI agents, solutions, and personalized experiences, delivering value across locations and hybrid workplaces.

Optimize agility
Build, scale, and operate a hybrid AI factory with ease to reduce technical debt and drive operational efficiencies with modern AI infrastructure, devices, models, and services.

Innovate with trust
Achieve trusted, compliant, and responsible AI by managing and protecting data with Lenovo expertise, validated solutions across the enterprise, and managed services for post-deployment support.

Lenovo Hybrid AI Advantage™ with NVIDIA allows you to leverage **Lenovo Validated Designs** (LVDs), pre-tested and optimized reference architectures to accelerate implementation. Lenovo offers AI infrastructure solutions that enhance manufacturing processes through real-time production monitoring and business intelligence customized to your needs.

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Start ahead and stay ahead

The **Lenovo AI Library** is a resource that provides a portfolio of customizable, tested, and proven vertical and horizontal use case accelerators that manufacturers can leverage to deploy agentic AI quickly and easily. These developed and validated solutions help simplify implementation and move you more quickly to ROI.

Some of the use cases available include:

- **Content generation:** Automate content generation, from product design documents to sales materials, enhancing overall content quality and automated personalization.

- **Customer service:** Improve overall customer service efficiency through reduced response times, automated chatbot interactions, and other customer support services.

- **Knowledge assistants:** Enhance enterprise knowledge sharing, from factory operation manuals to product catalogs, reducing data silos. Automate and streamline production line workflows with a knowledgebase assistant, increasing productivity.

Working with **Lenovo AI Fast Start** services, you can develop custom AI use cases specific to your business and industry needs in under 90 days using your own data and workflows.

If there is not a validated use case for your organization's needs, Lenovo's agentic AI platform, a comprehensive framework for deploying and scaling agentic AI, gives you access to an array of pre-configured APIs, software development kits, and blueprint templates to pull from.

Some examples of how manufacturers are developing these solutions include::

- **Predictive maintenance:** Autonomously analyze equipment functions and data to predict failures and proactively trigger maintenance requests.

- **Quality inspection:** Analyze production data, testing reports, and detection documentation to predict patterns to get ahead of quality issues.

- **Pick Assist Autonomous Robot (AMR):** Utilizes the most advanced "order-to-person" human-robot collaboration to help eliminate the need for manual route planning, warehouse redesign, or human intervention.

- **Automative Storage and Retrieval Systems (AS/RS):** Offers high density, flexibility, and scalability in automated stereo warehouses and combines a variety of robotics with AI algorithms to unleash the potential of precise and agile pallet movement.

- **Warehouse Execution System (WES):** Focuses on real-time coordination and optimization of material handling tasks and easily integrates automation resources from different brands into one unique platform.

- **Advanced Planning and Scheduling (APS):** A new planning system, leveraging digital twin technology and developed in-house by Lenovo, powers Lenovo's smart device manufacturing without requiring pausing the line to retool for new projects.

- **Recruiting and HR:** Resume screening, interview scheduling, and onboarding assistance help support HR in identifying and hiring needed talent.

These use cases offer flexibility, allowing manufacturers to choose from a range of sizes, locations, deployment methods, and managed services options aligned to the specific needs of their business.

Deploy more efficiently with pre-validated infrastructure foundations

Lenovo AI Services experts tap into **Lenovo Hybrid AI Advantage™ with NVIDIA** solutions. Based on pre-validated industry-leading technology including **ThinkSystem** and **ThinkEdge** servers and **ThinkAgile** solutions, along with **NVIDIA Grace Hopper** and **NVIDIA RTX PRO 6000 Blackwell Series GPUs**, Lenovo Hybrid AI Advantage™ with NVIDIA speeds AI infrastructure deployment.

Smart manufacturing

Industrial workplace safety

AI quality inspection/ computer vision

Predictive maintenance/ digital twin

IT automation

Having pre-tested configuration roadmaps available simplifies deployment, provides easier management at scale, and reduces risk by eliminating trial-and-error efforts. Working with Lenovo's agentic AI platform, AI services can deliver an agent in as little as 90 days.

The data-driven innovation advantage

Flexible access to Lenovo's AI expertise and proven tools helps manufacturers make faster, more informed decisions so they can find innovative ways to improve operations.

- ✓ **To help manufacturers get started safely and responsibly, Lenovo AI Services includes assessments to help evaluate your organization's AI readiness and provide a concrete action plan to start adopting AI in a way that delivers results quickly while proactively mitigating risks.**

- ✓ **Safe, compliant, AI-ready data is key to AI deployment success. Lenovo and NVIDIA have collaborated with Centific AI Data Foundry to provide a pre-tested, scalable solution that fuses Lenovo ThinkSystem servers and NVIDIA accelerated computing technology to conquer data complexity and access for more predictive insights and automation.**

- ✓ **Lenovo AI Services provides a wide range of support, including AI discovery workshops and advisory services, AI agent design, implementation, and management, which free up your valuable IT resources while ensuring your systems are monitored and effectively maintained.**

- ✓ **Scaling seamlessly as needs evolve, Lenovo TruScale Infrastructure as a Service (IaaS) helps you transform without disruption and high upfront costs through a convenient pay-as-you-go model.**

Lenovo Hybrid AI Advantage™ with NVIDIA solutions brings AI to where it makes the most impact — empowering teams to be more productive. Our expert AI services team taps into Lenovo Validated Designs across leading technologies, our AI Library, and Lenovo's agentic AI platform in support of the rapid customization of pre-validated use cases and development of new AI agents and assistants, while our full-stack Lenovo Hybrid AI factory optimized with NVIDIA unlocks relevant intelligence from your data and AI models securely, efficiently, and responsibly.

Discover what your organization can accomplish with Lenovo Hybrid AI Advantage™ with NVIDIA solutions today.

Visit Lenovo.com/hybridai to learn more.

Lenovo Hybrid AI Advantage™ with NVIDIA

Ready to deploy agentic AI in your manufacturing operations?

Lenovo Hybrid AI Advantage™ with NVIDIA solutions streamlines the process of deploying agentic AI and the computing infrastructure to support the AI lifecycle, and through the process, we can help manufacturers at each step to ensure long-term success in their deployment.

☐ **1. Assessment and planning:**

Identify tasks that are repetitive, rules-based, and time-consuming but require some level of intelligence. Define clear goals and objectives and review data governance, looking for gaps that may need to be addressed prior to deployment. **Lenovo AI Services** can help rapidly assess a manufacturer's environment and capabilities to identify, design, and implement an AI solution in as little as 90 days.

☐ **2. Data preparation:**

Collect necessary data and clean it to remove inaccuracies and duplicate information. Structure your data so it is usable in your AI models. Lenovo can help you assess your current infrastructure and data situation and provide pre-validated reference architectures with the latest Lenovo and NVIDIA technologies through **Lenovo Validated Designs** (LVDs).

☐ **3. Developing agentic AI:**

Lenovo AI Library provides a suite of ready-to-customize manufacturing and general-purpose use case accelerators from more than 165 ISV solutions in the **Lenovo AI Innovators** program. When paired with Lenovo AI Services, you can take advantage of both Lenovo's agentic AI platform and AI Innovators program to build more customized solutions. Next, set up safety controls around content filtering and output validation, and begin detailed audit logging.

☐ **4. Deployment and integration:**

Set up your deployment environment, configuring servers and databases, and setting up resources. Integrate your AI agents with your existing systems.

☐ **5. Monitoring and optimization:**

Keep an eye on output and performance logs, while also tracking your own metrics and KPIs. Automate performance tracking and implement feedback loops that deliver continuous learning and improvements to the AI agents.

☐ **6. Workforce adaptation and change management:**

Train and upskill your employees to collaborate effectively with AI. Foster a culture of innovation and encourage employee input on optimization ideas.

☐ **7. Governance and security:**

Develop clear AI governance policies and implement strict access controls. Ensure data privacy and align with compliance initiatives and regulations. Lenovo experts from our **AI Center of Excellence** can help.

☐ **8. Continuous improvement:**

Start out with pilot programs and then scale and iterate what works. Conduct regular performance reviews and incorporate new AI capabilities as they become available.

Take the next step toward an AI-powered future today with Lenovo and NVIDIA.

Visit **Lenovo.com/hybridai** to learn more.

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