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Edge AI from Lenovo and Intel®

Your guide to maximizing manufacturing efficiency

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Introduction

Maximizing manufacturing

Welcome to the Lenovo and Intel® guide to maximizing your manufacturing edge. We have put this resource together to help you to navigate the power of artificial intelligence (AI) and edge computing so that you can unlock intelligent transformation, drive operational efficiency, and deliver greater productivity.

From predictive maintenance to computer vision-enabled quality control, and from real-time supply chain analytics to digital twin modelling, Lenovo and Intel® bring power and performance to where manufacturers need it most.

Our comprehensive portfolio of software, services, and Intel® powered hardware sets us apart, positioning Lenovo as a transformative leader in the competitive AI industry. Discover how we can help you unlock smarter decision-making, accelerate workloads, right-size infrastructure, simplify and scale – all at the edge.

This interactive guide offers actionable insights and use cases to help start your business accelerate its transformation.

Take this journey with us, as we venture into the exciting – and rewarding – realm of edge AI.

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Powering Edge AI with Lenovo and Intel®

Intel® and Lenovo's partnership brings together Intel's processing prowess and Lenovo's powerful hardware. The result? High-performing, secure and reliable computer power where data is generated for fast insights and faster return on investment.

The Intel® and Lenovo partnership also means that your edge deployments will benefit from the very best management tools, such as Lenovo XClarity One, which enables you to deploy edge solutions rapidly and securely, enhancing the performance, reliability and overall efficiency of your infrastructure. The Intel® Tiber™ Platform enables you to leverage mass customization and use-case specific software, so it speeds up your time to market with built-in optimizations and streamlined solution management. Lenovo Open Cloud Automation (LOC-A) expedites the deployment of distributed edge infrastructure, so that you require fewer resources and reduce CO2 emissions. It also gets you results by bridging the gaps between tooling and your infrastructure management teams.

Plus, you can gain expert advice from the Lenovo AI Center of Discovery and Excellence, offering AI Discovery to AI Advisory Services and AI FastStart POCs in just 90 days. And, if you don't want to invest in infrastructure Lenovo's TruScale offers you flexible pay-as-you-go solutions for your devices, infrastructure, and data management options. This means you can avoid over-provisioning and benefit from real-time cost insights for predictable budgeting with no surprises.

→ Lenovo XClarity One

→ Lenovo Open Cloud Automation (LOC-A)

→ Intel® Tiber™ Edge Platform

Resources:

→ Lenovo and Intel building solutions for tomorrow website

→ Edge computing solutions and technologies from Intel website

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The manufacturing business case for edge AI

Is your organization facing:

- Supply chain disruption?
- Labor shortages and skills gaps?
- Rising operational costs?
- Quality control and compliance regulations?

What if... Lenovo and Intel® could help accelerate your AI initiatives, transforming raw data into actionable insights at lightning speed no matter where it's generated?

85%

of industrial manufacturing firms are implementing, or have already implemented, IoT[1]

For manufacturers Edge AI promises a powerful combination of AI to drive operational efficiency and edge to accelerate time to insights. **It will help you deliver:**

Predictive maintenance.
Issue real-time alerts by monitoring assets and sensors to measure temperature, motion, and vibration.

Digital Twin data modelling.
Optimize processes and realize cost savings by creating a virtual representation of assets and processes.

Computer vision.
For enhanced, video-led quality control.

Supply chain analytics.
deploy real-time inventory tracking for product matching.

The Lenovo + Intel® approach:

Lenovo ThinkEdge® offers the broadest edge portfolio on the market, featuring the highest performance-per-accelerator (PPA) and most advanced embedded graphics performance. Plus, the **Lenovo AI innovators program** has more than 165 industry and horizontal ISV AI solutions for you to leverage.

Your edge AI checklist:

☐ Identify priority business use cases

☐ Develop AI and edge proof of concept

☐ Create technology foundation framework

☐ Develop training plan and ecosystem collaboration

Resources:

→ Transforming manufacturing with edge computing infographic

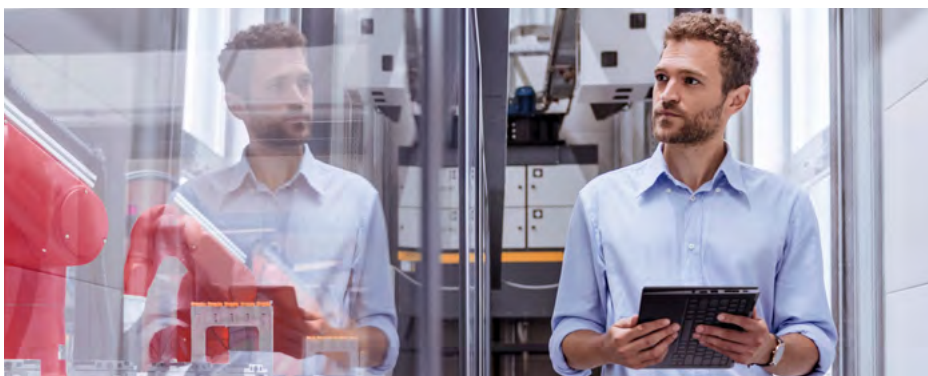→ AI-assisted Visual Inspections and faster Data Analytics case study

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1 HFS Research, https://www.hfsresearch.com/research/the-industrial-manufacturing-industry-has-the-highest-adoption-of-iot-among-all-industries/

Manage and optimize AI data on the edge

What if... you could make the most of IoT and smart sensors to capture, process, and store data at the production line or the factory floor, and then apply AI to make data-driven decisions in near-real time that will optimize the manufacturing process?

70%

of manufacturing organizations have implemented some form of AI into their operations[2]

Edge computing is key to maximizing manufacturing's potential. The rapid adoption of AI, IoT devices, and smart sensors is creating troves of data. Edge computing harnesses this data at the source, speeding transmission and providing immediate business intelligence. It also helps you to increase the scalability of manufacturing applications and efficiently process vast datasets.

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The Lenovo + Intel® approach:

To make the most of your edge data, combine Lenovo ThinkEdge, powered by Intel® with software-defined, high-performance ThinkAgile® clients and servers, together with ThinkSystem® storage solutions. Lenovo also offers AI Discovery and AI Advisory Services and AI FastStart POCs in just 90 days, as well as **Lenovo TruScale** flexible pay-as-you-go solutions for your devices, infrastructure, and data management options. Plus, Lenovo's open partner ecosystem offers integration paths with partners such as NetAppTM AIPod, and Cloudian.

Your edge AI checklist:

☐ Create short and long-term milestones for your AI and edge strategy

☐ Outline investment needed for data infrastructure

☐ Set-up processes for data quality and accessibility

☐ Develop a performance monitoring framework

Resources:

→ How to unlock smarter decision-making at the edge website

→ Harnessing the power of edge computing flyer

→ Unleashing the power of edge computing flyer

2 Rootstock, https://www.rootstock.com/wp-content/uploads/2023/11/AI-in-MFG-Survey-Findings-10.2023.pdf

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Protect all your AI data

What if... you could manage and protect your organization's physical and digital security at the edge, safeguarding data, guaranteeing the sovereignty of your AI stack, and protecting IP?

50%

of chief information security officers (CISOs) believe that data encryption is a top priority[3]

Edge computing has the potential to revolutionize manufacturing, helping you transform connectivity and productivity:

Process data closer to where it is created and reduce latency

Facilitate real-time analysis and decision-making

Decrease the attack surface for potential cyber threats

Protect data with hardware-based encryption and strong authentication and authorization controls

The Lenovo + Intel® approach:

Address the evolving threat landscape with **Intel vPro®** and **Lenovo ThinkShield** offering your organisation:

- **Multilayered security;** from the hardware level up to the application level

- **Hardware-based protection**; provide a secure foundation for the device

- **AI-powered threat detection;** identifying and mitigating potential threats quickly

- **Remote management;** allowing IT teams to remotely discover, configure, update, and repair devices

- **Enhanced performance;** with up to 59% better application performance[4]

- **Comprehensive lifecycle protection**; from development to disposal

- **Virtualization security;** enhances protection for virtualized environments

- **Data encryption;** to protect sensitive data efficiently

Your edge AI checklist:

- [ ] Establish a multi-layered security framework
- [ ] Develop robust data and compliance policies
- [ ] Safeguard AI models and pipelines
- [ ] Create an incident response plan

Resources:

→ Fortifying the edge with advanced security flyer

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3. Source: Lenovo Intel Campaign - Security Flyer
4. Source: with Intel Core™ Ultra processors

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Cost management and sustainability

What if... you could harness the benefits of edge AI while minimizing your organization's environmental impact and maximizing cost effectiveness at the same time?

As data processing demands increase so environmental sustainability obligations increase. That's why Lenovo offer services designed to address the issue.

Lenovo Premier Support
Your IT teams need to be able to focus on your growth and innovation. With our Premier Support you get prompt issue resolution with advanced technical support 24x7x365 via a dedicated phone number routed to a Lenovo engineer.

Lenovo CO$_2$ Offset Services estimate carbon emissions and offset them through global climate action projects, which are verified third-party organizations such as the United Nations.

Lenovo Asset Recovery Services (ARS) helps you minimize waste and maximize circularity by securely managing the lifecycle of your IT hardware and effectively managing your end-of-life IT assets.

Hand-in-hand with environmental responsibility, there is an obligation to manage the cost of edge AI projects as they move from proof of concept to full deployment.

Lenovo TruScale
Infrasctructure As A Service is a pay-as-you-go model. It aligns infrastructure with your demands, avoiding over-provisioning and providing real time cost insights and predictable budgeting.

Your edge AI checklist:

☐ Offset edge AI hardware emissions

☐ Prep for asset recovery in all locations

☐ Estimate usage across project lifecycle

☐ Opt for pay-as-you-go model

Resources:

→ Lenovo and Intel know sustainability matters website

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Manufacturing case studies

Learn how other manufacturers have benefited from moving to the edge.

Ducati

See how Ducati Corse delivers record-breaking success by combining its visionary leadership and world-class racing talent with Lenovo's engineering excellence at the edge.

Learn more →

Smartia

Discover how Lenovo, Smartia, and the National Composites Centre collaborated to create an anomaly detection and waste management solution for manufacturing.

Learn more →

ByteLake

Explore how byteLAKE helps manufacturers improve quality, enhance process monitoring, provide predictive maintenance, and deliver smarter what-if scenarios, by combining Lenovo Edge with Intel® Distribution of OpenVINO™ toolkit

Learn more →

Nybl

Learn how Nybl's Lift.ai, powered by Lenovo Edge technology, delivers intelligent and cost-effective insights to oil and gas companies, helping them maximize efficiency.

Learn more →

Guise AI

Providing anomaly detection, computer vision, and predictive maintenance – how Guise AI and Lenovo joined forces to deliver actionable insights from real-time data.

Learn more →

Our ThinkEdge product portfolio

Light   **Performance**   **Heavy**

Data Capture & Translation

- X-BUS
- A/D : TCP
- Connectivity Bridge
- HMI

Sensor Aggregation & Vertical Workloads

- Data Structuring
- Industrial Protocols
- Reduction Filtering

AI-Enabled

Consolidation & Accelerated AI Workloads

- Local AI/ML Workloads
- Intelligent Video Analytics (CV)

- Deep Learning
- Hyper-Converged Infrastructure

SE10

Featuring Intel Atom® processors for unconstrained performance for all your data-capturing challenges at the edge, in a convenient modular design.

Learn more →

SE30

Powered by 11th Gen Intel® Core™ i5 vPro® processors, the high-performing SE30 is purpose-built for challenging edge applications.

Learn more →

SE50

For superior computational capabilities at the edge. Featuring an Intel® Core™ processor, it's perfect for growing IoT environments.

Learn more →

SE100

A compact, AI-ready edge solution, perfect for constrained spaces without compromising performance, featuring Intel® Core™ Ultra processors.

Learn more →

SE350 V2

Purpose-built edge computing server featuring an Intel® Xeon® D processor suitable for harsh environments with extended temperature range, high shock, and vibration tolerance.

Learn more →

SE360 V2

Compact server featuring an Intel® Xeon® D processor with rugged reliability, ideal for space-constrained environments.

Learn more →

SE450

A compact edge server designed for remote location needs and with the power to run AI workloads. Featuring an Intel® Xeon® Platinum processor and increased security and manageability.

Learn more →

A **Lenovo solutions expert** can help to bring the most secure and reliable compute power closer to data generation for faster business outcomes.

Our infrastructure portfolio

Lenovo ThinkSystem

Explore our range of Intel® Xeon® and Intel® Optane™ powered servers and storage arrays for unmatched value, flexibility and industry-leading efficiency. Designed to meet mission-critical demands with legendary quality and reliability.

Learn more →

Lenovo ThinkAgile

Manageable and easy to deploy software-defined infrastructure from Lenovo, the ThinkAgile portfolio based on Intel® Xeon® processors simplifies infrastructure adoption and accelerates time to value.

Learn more →

Intel® Xeon® processors

Intel® Xeon® processors are specialized CPUs designed for high-performance computing, servers, and workstations. They offer key benefits that set them apart from consumer-grade processors.[4]

Are designed for AI, with more data centre accelerators than any processor on the market

Are the most sustainable, lowering costs and shrinking carbon footprints

Deliver 21% better overall performance

Have the most comprehensive data centre security technologies

4. 5th Gen Intel Xeon Processors Explained in 60 Seconds