



Lenovo + Compugen Systems:
Accelerating Al Adoption in
the Modern Workspace with a
Hybrid IT Architecture

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Introduction

Al is the one thing IT and business leaders can't afford to ignore in 2024.

As of March 2024, 35% of global organizations use AI, 42% are exploring its use, and over 50% plan to incorporate AI technologies in 2024 — meaning over 77% of businesses are currently using or exploring AI.

92.1% of businesses have seen measurable results from AI in 2022, up from 70.3% in 2020 and 48.4% in 2017. (Orion Policy Institute)

90% of business leaders believe AI will give their organizations a competitive advantage. (MIT Sloan)

Using ChatGPT to draft an email is no big deal, but expanding AI technologies to every business process to support a modern, hybrid workforce is a different ballgame. Wide-scale AI deployment has many unique challenges, and organizations must implement the proper IT infrastructure, software, and hardware to achieve the desired outcomes.

This guide explores AI in the modern workspace, the challenges of wide-scale AI adoption, how a hybrid IT architecture helps address these roadblocks, and how Lenovo's Smart Infrastructure solutions can help you accelerate your AI initiatives.

Al in the Modern Workspace

Al technologies have advanced significantly in the past few years, helping organizations improve operational efficiency, reduce costs, support data-driven decision-making, and deliver a modern customer experience. Top use cases include:

• Automate repetitive tasks, allowing employees to focus on complex and creative endeavors while eliminating costly human errors from many business procedures.

80% of retail executives expect their businesses to adopt AI automation by 2025. (Analytics Insights)



- Process large volumes of data quickly and accurately, enabling organizations to gain timely insights and make accurate, data-driven decisions.
- Analyze operational data to identify inefficiencies and offer recommendations for optimizing workflows to improve cost-efficiency and productivity.
- Use predictive analytics to forecast trends, anticipate market demand, and identify risks so businesses can address potential issues proactively.

Nearly all (99%) financial services leaders surveyed say their organizations were deploying AI. (EY)

- Analyze customer preferences and behaviors to deliver personalized experiences through targeted marketing, product recommendations, and customized user interfaces to drive engagement, retention, and sales.
- Improve customer service while lowering support costs with AI-powered chatbots.
- Gain customer insights through sentiment analysis using AI-powered natural language processing (NLP) technologies.
- Leverage image and speech recognition functions to support applications like facial recognition for security purposes, medical imaging analysis in healthcare settings, and voice assistants for handsfree interactions.

Almost 30% of healthcare executives in the U.S. consider adopting AI for clinical decision-support tools a priority. (Statista)

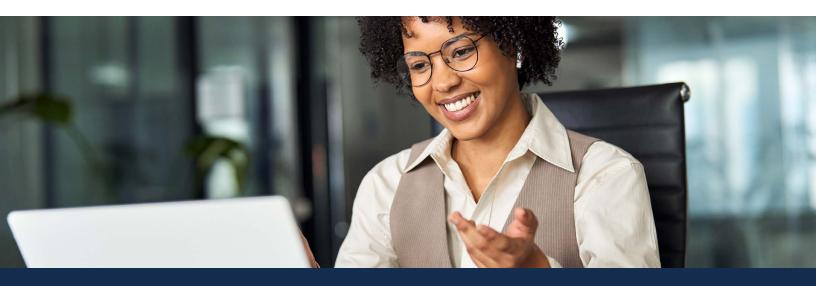
Making AI Capabilities Available For a Hybrid Workforce

In today's remote and hybrid working environment, organizations must ensure all employees have access to AI capabilities no matter where they are. Universal accessibility supports equitable participation, enabling every team member to contribute meaningfully using the same tools and applications.

Universal access to AI technologies also facilitates seamless collaboration and improves productivity. They help you streamline processes, automate routine tasks, and empower employees to work effectively from anywhere.

Moreover, improved accessibility helps drive innovation by broadening your talent pool, incorporating diverse perspectives and experiences, and encouraging creativity across teams. It helps build a resilient workforce that can adapt to changing circumstances and sustain business continuity during disruptive events.

Learn more about our Modern Workspace services to see how we can help you maximize the benefits of hybrid work.



The Challenges of Wide-scale Al Adoption + Deployment in the Modern Workspace

Successful AI adoption requires companies to address the roadblocks and implement the appropriate infrastructure. Let's examine the most common hurdles preventing them from incorporating AI in their workflows and processes.

While 75% of survey respondents experimented with generative AI in 2023, only 9% said they had adopted the technology widely. (CNBC)

Data Management

To maximize the benefits of AI and make accurate predictions, organizations must provide their training models with high-quality data. As such, they need to invest in robust data management infrastructure and processes (e.g., a data warehouse) to break down data silos and ensure AI algorithms receive clean, relevant data.

Computing Power

Training complex AI models requires substantial computational resources, including high-performance CPUs, GPUs, and/or specialized AI accelerators like TPUs (Tensor Processing Units). Many organizations lack the infrastructure or expertise to deploy and manage these computing resources cost-effectively to maximize their ROI.

I/O Bandwidth

Al workloads often involve processing massive data sets, requiring high-speed data transfer and storage capabilities. Insufficient I/O bandwidth may become the bottleneck for Al implementation, slowing processing times and hindering real-time decision-making.

Thermal Efficiency

Many Al applications involve intensive computing tasks that generate a vast amount of heat — requiring effective cooling solutions to prevent hardware failures and maintain performance. Organizations must consider thermal efficiency, especially in data centers or edge computing environments where space and power constraints are significant concerns.



Advanced Security Architecture

Al systems that process vast amounts of data are prime targets for adversarial attacks, data breaches, and model poisoning. Many organizations also need to give third-party Al tools access to proprietary data. Companies that fail to take the proper precautions could risk exposing their confidential data and violating regulatory compliance requirements.

Rapid Scalability

The fast pace of AI adoption means organizations must have the capabilities to scale their AI infrastructure and deploy applications rapidly to accommodate increasing workloads and user demands without sacrificing performance or reliability.

Edge Deployment

Some industries need to bring AI capabilities to the edge to maximize their investment. For example, real-time AI inference at the edge enables predictive maintenance, quality control, and process optimization in manufacturing facilities.

Meanwhile, utility companies use AI-powered edge analytics to monitor infrastructure, optimize energy distribution, and detect anomalies. Edge AI applications in retail enhance customer experiences, optimize inventory management, and support marketing personalization strategies in retail environments.

However, deploying AI algorithms on resourceconstrained edge devices requires performance optimization, power efficiency, and reliability. You must also ensure the edge devices' interoperability and data security for successful implementation.



How a Hybrid IT Architecture Helps Solve AI Adoption + Deployment Challenges

A hybrid IT architecture combines on-premises and cloud-based infrastructure to maintain and manage an enterprise's IT resources. It offers a flexible and comprehensive approach to solving AI adoption and deployment challenges for a distributed workforce.

Hybrid IT provides ubiquitous access to AI resources, making advanced capabilities available to users anywhere using any device to promote accessibility, inclusivity, and collaboration. The seamless integration between on-premises data repositories and cloud storage solutions facilitates the handling of large volumes of data required for AI applications.

Meanwhile, cloud-based resources enable organizations to scale their AI workloads up or down on demand with dynamic computing resource allocation. You can optimize performance and responsiveness without the costs of over-provisioning or underutilization.

By distributing processing tasks across on-premises infrastructure and cloud-based resources, organizations can adapt to workload characteristics and resource availability to achieve faster time-to-insight.

Moreover, a hybrid architecture allows you to balance the predictable costs and low-latency access of on-premises resources with the pay-as-you-go pricing and scalability of cloud computing to maximize cost efficiency and meet budget requirements.

You may implement robust security and compliance measures by leveraging on-premises controls for sensitive data and applications and cloud-based security services for threat detection, access control, and data encryption to protect the information processed by AI applications or used for model training.

Additionally, a hybrid architecture facilitates the incorporation of AI capabilities with existing IT systems and workflows via hybrid integration platforms and APIs. You can connect AI applications with enterprise applications, data sources, and business processes for seamless integration and interoperability.

However, the complexity of designing and implementing a hybrid IT infrastructure prevents many organizations from getting the most out of their investment in AI technologies and applications.

At Compugen Systems Inc., we help organizations implement a value-driven approach to hybrid IT by selecting the right mix of on-premises and private or public cloud services to meet your business and IT requirements.

Besides designing and optimizing your architecture, we help you implement best-of-breed hardware to support the demanding workloads of the latest AI technologies. That's why we partner with <u>Lenovo's Infrastructure Solutions Group (ISG)</u> to bring the most advanced solutions to our clients to support your AI adoption and deployment initiatives.

Learn more about our Hybrid IT services to see how we can help you save costs, scale fast, and innovate boldly.

Lenovo Smart Infrastructure Solutions Accelerates Al Adoption

Lenovo ISG provides infrastructure solutions with advanced computing and analytics capabilities to support AI applications in retail, manufacturing, healthcare, finance, and other sectors. Our partnership enables our clients to access Lenovo's extensive offerings:

- The ThinkSystem portfolio of servers works with your existing infrastructure and adapts to shifting workloads. It maximizes the performance, capacity, security, and availability of your onpremises architecture to support the implementation of AI technologies.
- The ThinkAgile portfolio of software-defined, hyper-converged infrastructure (HCI) combines compute, storage, and virtualization software into a resource pool. It provides a ready-made platform for hybrid cloud implementation to support distributed teams.
- TruScale is an IT infrastructure-as-a-service (IaaS) model that provides a pay-as-you-go option for hybrid workplaces and environments. It combines hardware, software, and infrastructure to meet evolving business needs. The new TruScale GenAl as-a-service provides Al capabilities to increase flexibility, scalability, and predictability in Al deployment.

Selecting hardware with the appropriate capabilities to support your AI implementation requirements is a high-stakes decision. Let's delve into why we recommend Lenovo's offerings to our clients to maximize their IT investment.

Lenovo ThinkSystem + ThinkAgile: Successful AI Deployment at Your Fingertips

Lenovo collaborates with NVIDIA to provide enterprises with the critical accelerated computing capabilities required by today's and tomorrow's Al applications. The purpose-built hybrid solutions bring augmented intelligence to when and where users need it — from edge devices to the cloud — to support massive scaling of AI capabilities.

The technologies improves real-time computing, power efficiency, and ease of deployment to deliver the performance enterprises need for implementing AI applications to gain real-time insights from their datasets and enhance productivity.

Bring AI To the Edge

Lenovo's ThinkAgile MX455 V3 Edge Premier Solution brings AI inferencing and real-time data analysis to the edge with the highest power efficiency of any Azure Stack HCI Solution. It integrates with onpremises and Azure cloud to help organizations reduce total cost of ownership (TCO) and gain agility to adopt software innovations quickly.

Boost Compute Power

The ThinkSystem R685a V3 8GPU server delivers extreme performance for the most computedemanding AI workloads, including GenAI and Large Language Models (LLM). The solution handles massive datasets with fast acceleration, large memory, and I/O bandwidth to support financial services, healthcare, energy, climate science, transportation, and other use cases.

Increase Thermal Efficiency

Lenovo Neptune's liquid cooling technology ensures maximum performance while reducing power consumption by up to 40% and improving thermal efficiencies by 3.5x compared with traditional aircooled systems. The system will save you energy costs and help advance your sustainability initiatives.



A Closer Look at Lenovo's ThinkSystem Al Portfolio

ThinkSystem's AI portfolio features two new 8-way NVIDIA GPU systems purpose-built to deliver massive computational capabilities while increasing power efficiency for generative AI, NLP, and LLM development and applications.

The NVIDIA B200 Tensor Core GPUs can achieve up to 25x more real-time inferences to accelerate trillion-parameter language models to handle the most demanding generative AI, data analytics, and highperformance computing (HPC) workloads.

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> Lenovo PG8A0N, a 1U node for AI, supports the NVIDIA **GB200 Grace Blackwell Superchip to supercharge** Al training, data processing, engineering design, and simulation.

- 45x faster real-time LLM inference
 - 40x lower TCO
 - 40x less energy consumption
- The ThinkSystem SR780a V3 uses Neptune liquid cooling technology to sustain maximum performance without hitting thermal limits. Since the method is more efficient than air cooling, it consumes less energy to lower operating costs. Moreover, the hardware fits in a dense 5U package to conserve valuable data center real estate.
- The ThinkSystem SD535 V3 server maximizes performance per rack for intensive transaction processing to support cloud computing, big data analytics, and real-time e-commerce transactions.
- The ThinkSystem SR680a V3 provides maximum acceleration for complex AI to deliver massive computational capability. It uses industry-standard 19-inch server racks, allowing for dense hardware configurations to eliminate the need for excessive floor space or shelving.

Lenovo's AI portfolio also includes XClarity Systems Management to simplify and centralize physical infrastructure management. Meanwhile, Intelligent Computing Orchestration (LiCO) streamlines the deployment of clustered computing resources for AI model development and training and HPC workloads.

Moreover, the portfolio supports the 4th and 5th generation of Intel Xeon Scalable Processors and offers thermal headroom for future higher-power GPUs. You can upgrade instead of buying new hardware to accommodate growth and maximize your investment.

Lenovo Al Portfolio in Action

In retail, AI technologies help analyze customer movements and behaviors to improve traffic flow and real-time inventory management. In manufacturing, they can inform predictive maintenance to minimize unplanned downtime. In city planning, AI helps optimize space, infrastructure, and asset utilization to manage traffic flow and reduce power consumption.

Meanwhile, AI enhances fraud detection and KYC (know your customer) initiatives in the financial industry. It can also support algorithmic trading strategies, risk management (e.g., real-time transaction monitoring and value-at-risk), credit issuance (e.g., loan analysis and approval recommendations), regulatory compliance, and more.

These real-world use cases show how Lenovo's AI portfolio helps companies in every industry stay at the forefront of innovation.

Queue + Crowd Analytics

Lenovo and Intel partnered with WaitTime, an Al software for monitoring and engaging with crowds, to offer a solution for observing, measuring, and maximizing customer spaces. It uses proprietary algorithms to help venues communicate and manage densities as people enter, navigate, and exit a facility, informing business intelligence, safety, and design practices.

Read the case study.

Safe + Efficient Manufacturing

Lenovo supports AI analytics capabilities for smart manufacturing projects in partnership with Graymatics and NVIDIA. Besides optimizing processes, the technology improves safety by detecting workplace accidents and employee issues or altercations. It also monitors employee access through facial recognition and identifies and tracks unauthorized personnel.

Read the case study.





24/7 Customer Service

Lenovo and NVIDIA partnered with DeepBrain AI to create digital employees that understand commands from customers and provide timely, valuable information. Organizations can customize AI Humans in kiosk applications in banks, convenience stores, train stations, and more to deliver on-brand and meaningful customer interactions.

Read the case study.

Real-time Data Extraction at the Far Edge

Lenovo and Guise AI developed anomaly detection and predictive maintenance solutions at the edge to reduce unplanned downtime, optimize business processes, increase production, transform the customer experience, and increase ROI. Meanwhile, computer vision supports retail and smart city use cases to improve operations and customer experience.

Read the case study.

Accelerate AI Deployment in the Modern Workspace

Al applications help businesses increase operational efficiency, lower costs, minimize downtime, improve customer experience, make accurate forecasts, and more. However, implementing these technologies in a hybrid work environment to maximize scalability and accessibility while ensuring data security is challenging.

We partner with Lenovo ISG to bring our clients cutting-edge solutions to accelerate AI deployment.

We support Lenovo's hardware and capabilities with expertise in hybrid IT and modern workspace implementation to ensure seamless integration of the latest AI technologies with your current infrastructure and business requirements to maximize ROI.

Schedule a meeting with one of our specialists to accelerate your AI adoption and implementation.



The Compugen Difference

We start by understanding your business requirements and objectives to identify the best architecture and solutions for your needs. We also have the capabilities to see the project through — from system design and procurement to implementation and maintenance — aligning the execution with your vision to ensure long-term success.

CHANGE YOUR WORLD FOR THE BETTER