# KPMG

Pushing Boundaries:
How to lead with Edge AI computing

A collaboration between IBM and KPMG ushers in a new era of rapid, secure, sustainable AI solutions

The emerging benefits
of Edge AI computing

Below, we outline the key benefits that make AI edge computing a strategic asset for forward-thinking organizations.

With modern AI, business and technology leadership methodically plan for the adoption, transformation, and financing required to deliver results that are profitable and fit for consumers. For many, what stands in the way are legacy computing, insufficient infrastructure and the need to upgrade cybersecurity protocols, all of which must be addressed to develop AI solutions based on zero-trust security, public cloud operability, latency, and cost-efficacy.

Enter AI edge computing. By processing data closer to where it is generated, this emerging technology can help address these challenges—enhancing security, reducing latency, and optimizing infrastructure efficiency.

Edge AI computing stems from recent advancements in real-time data processing, generative and agentic AI, large language model (LLM) learning, 5G connectivity, and UAV safety. This approach eliminates the step of transmitting data to a central data center or the cloud for processing. Instead, data is generated locally by edge devices, almost instantaneously processed by AI agents, and wirelessly transmitted in milliseconds, significantly increasing responsiveness and security. This novel approach enables data sovereignty, improves speed and latency, and ultimately reduces the total cost of ownership and technical debt associated with AI.

At present, hyperscalers are planning significant investments in large-scale data centers to meet growing AI and cloud computing demands. Persisting with this approach will strain the US electrical grid, while failing to deliver the need for continuous uptime required by industries such as healthcare, manufacturing, technology, and defense.

In contrast, distributed Edge AI networks take a microscaler approach by utilizing existing powered infrastructure like cell towers, substations, hospitals, and municipal facilities. Edge AI offers significant environmental benefits through reduced energy consumption, cooling requirements, land use, and supply chain complexity. Finally, since computing, data and AI processing are located physically closer to the enterprise, throughput is much more rapid and reliable than data centers and cloud-based facilities located hundreds or thousands of miles away.

IBM and KPMG LLC (KPMG) are collaborating to assist businesses with data center modernization strategies, network investment decisions, and the adoption of Trusted AI frameworks. This collaboration is helping to identify workloads and critical use cases better suited for Edge AI. As recognized thought leaders and practitioners in Edge AI computing, KPMG and IBM offer advanced capabilities and knowledge in technical testing, measurement, and validation for network infrastructure. IBM infuses client operations with edge technology, leveraging hybrid cloud, AI, and 5G. Highly ranked for AI advice and implementation, KPMG provides deep industry-specific expertise and strategic guidance to help companies determine where Edge AI computing can deliver the most value. This collaboration is unique in its ability to fast track Edge AI-driven innovation across diverse industries and uses cases.

In this paper, we provide details on how companies can increase the safety, security, and scalability of use cases ideal for Edge AI computing.

01
Ultra-low latency
AI edge computing processes data where it's generated and can outperforms cloud and data centers when it comes to latency or the time it takes data to travel to a central server and back.

02
High-throughput data access
Instead of sending data over slow, or at times, congested cloud networks or data centers, AI edge computing analyzes data generated locally. As a result, insights are generated in real-time or near-real-time.

03
Real-time analytics
Edge AI computing enables immediate action by processing and analyzing data in real time, which is crucial in high-pressure situations.

04
Impenetrable security/privacy
Data processed at the edge rather than transmitted to cloud or central servers reduces the attack surface for data breaches and cyberattacks.

05
Scalability and flexibility
A key benefit of AI edge computing is its adaptability to scale up and down based on the requirements of different environments and objectives.

06
Multi-agentic control
AI edge computing enables multiple agentic devices to autonomously coordinate and make decisions based on local data, supporting applications like swarm robotics and distributed sensor networks.

07
Rigorous data provenance
Rigorous data provenance in AI edge computing ensures transparent tracking of data from its origin through processing, enhancing trust in generated insights.

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> Edge AI computing isn't new; however, this may be the first time we are getting it right with AI, unleashing tangible business results and high-value use cases for both commercial and public sectors.
>
> **Greg Corlis, Partner KPMG Emerging Technologies**

From stadium streets to surgical suites:
Edge AI computing offers a brighter future

Edge AI computing and deterministic networks (DetNets) provide unprecedented performance for use cases requiring immediate and more secure data analysis. Edge nodes overcome bandwidth challenges with cloud processing, while DetNets monitor progress with drones and defend against intrusions. Use cases encompass manufacturing facilities, transportation hubs, retail outlets, college campuses, and geographical borders. Following are three illustrative examples:

Edge AI computing dramatically enhances security by enabling cyber security, local data processing, and real-time threat detection with force multiplication via local computing power. When it comes to surveillance, AI-powered edge solutions analyze live video feeds from cameras instantly, ensuring that critical situations are addressed within seconds.

At large venues like stadiums hosting sporting or music events, Edge AI technologies facilitate rapid facial recognition and crowd scanning at entry points and throughout seating areas. These systems detect anomalies such as crowd surfing or altercations, alerting security personnel immediately. AI models are also trained to spot specific threats, including weapons, ensuring rapid response without relying solely on manual monitoring, especially during nighttime events.

IBM's solutions are central to transforming event security, and its collaboration with KPMG experts on AI and emerging agentic implementations. Notably, IBM partnered with the Miami Dolphins to turn Hard Rock Stadium into a cutting-edge, smarter venue, setting up a new standard for event security and operational excellence. More recently, IBM has deployed edge AI and IoT solutions to drive efficiency, increase productivity, and deliver cutting edge digital experiences at events such as the US Open, UFC Insights (powered by watsonx), Wimbledon, and the Masters.

Smart Cities & AI-enabled Infrastructure

Smarter cities represent a forward-thinking approach to urban living, where advanced technologies transform how communities' function and thrive. By leveraging interconnected systems—such as smart grids, intelligent transportation, and real-time surveillance—cities like Barcelona, Vienna, and Singapore aim to create environments that are more efficient, secure, and responsive to the needs of their residents.

The integration of Edge AI computing is at the heart of this transformation, enabling cities to process vast amounts of data locally and respond to emerging situations and allocate resources in real time. Smart cities may include IoT-enabled smart poles, high-definition CCTV cameras, smart lighting systems, optimized EV charging, and weather or environmental sensors. This program can also help cities integrate safety and security best practices into the software development lifecycle (SDLC), implement granular security controls, and strengthen continuous threat exposure management. By prioritizing data minimization—collecting, sharing, and storing only essential information—they reduce the risk of unauthorized data exposure.

IBM and KPMG, with their partner Available Infrastructure, are empowering city leaders to build and manage safer, smarter cities with a first-of-a-kind, real-time edge AI paired with a zero trust cybersecurity solution: SanQtum AI, with IBM watsonx®. Available Infrastructure and IBM bring the fully integrated technology solution, complete with AI technologies, IBM Fusion Storage and Hardware. KPMG offers expert AI advisory services and Trusted AI framework compliance testing to enable cities to accelerate their implementations while ensuring they are tailored to specific needs.

Data-informed healthcare outcomes

Healthcare organizations are under constant cyber threats but must also respond to demands to deliver timely, deterministic, efficient, and secure care while navigating complex regulatory requirements and rapidly evolving AI technologies. As data volumes surge and the demand for real-time insights grows, Edge AI and sovereign cloud computing is emerging as a transformative solution in the health and human services sector.

Edge AI & DetNet computing can be applied to an array of healthcare applications, from remote patient monitoring (which may require data handling by thousands of sensors) and real-time emergency response to advanced medical imaging analysis. By enabling processing of complex computational workloads directly at the point of care—rather than relying on distant cloud servers—Edge AI empowers hospitals and clinics to respond quickly to critical health events with improved outcomes. Further, the proximity of data processing allowed by Edge AI helps guard against cyber threats and data breaches, while reducing the organization's energy footprint. This microscale approach can also bolster compliance with regulations such as HIPAA and ease the operational burden often associated with legacy systems and the ongoing need to modernize the digital infrastructure.

The collaboration between IBM and KPMG helps hospitals and clinics optimize their AI strategies, data management, and technology infrastructures through Edge AI. Healthcare engagements focus on shifting computing resources from centralized locations to the edge, thereby enhancing operational resilience and resource allocation, especially during network disruptions.

For example, in collaboration with one of the largest cloud providers, KPMG developed a purpose-built data configuration and transmission hub to address a hospital's detection needs. The solution leveraged Edge AI to provide a head start on sepsis diagnosis, a critical clinical improvement that can be instrumental in saving lives.

Enhanced event security

Large events like concerts, festivals, and sporting matches face unique security challenges due to the sheer volume of attendees, limited security staff, a growing need for real-time threat detection, and the complexity of crowd monitoring/management. Most traditional centralized systems can delay responses, but Edge AI computing changes the game by processing data on-site. Here's how:

Drones and high elevation positioned cameras constantly capture data, which is instantly analyzed by AI models and routed wirelessly to security teams within milliseconds. This enables immediate identification of suspicious activity, rapid communication of actionable intelligence, reduced false alarms and an expeditious response. With predefined escalation paths, security details can respond swiftly, elevating both safety and the attendee experience. The entire process—from data capture to alerting security—happens in just seconds, keeping large venues safer and more secure.

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> IBM and KPMG, through SanQtum AI with watsonx, have transformed city management, which enables DetNets to offer safer, smarter cities with real-time edge AI computing and zero trust cybersecurity.
>
> **Daniel Gregory,**
> **CEO, Available Infrastructure**

Emerging trends
in Edge AI

The landscape of computing is rapidly evolving, driven by technological advancements, evolving corporate frameworks and shifting organizational priorities. Following are the emerging trends poised to reshape the future of Edge AI and the most valuable use cases:
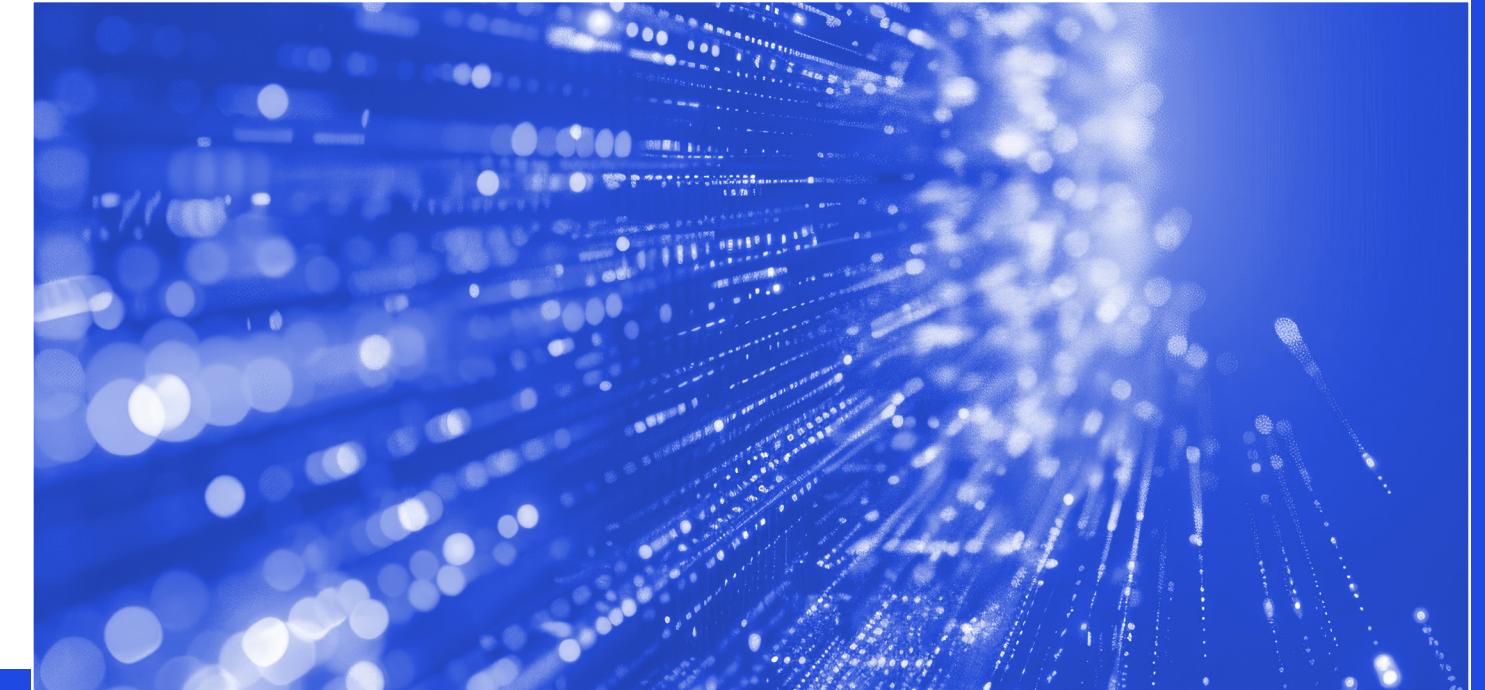
01
CapEx replaced by OpEx

The shift from capital expenditure (CapEx) to operational expenditure (OpEx) is redefining how organizations invest in technology and infrastructure, including Edge AI computing. By adopting OpEx models—such as subscription-based edge services, pay-as-you-go AI solutions (or "GPU as a service") and managed edge platforms—businesses can potentially avoid large upfront investments in hardware and instead flexibly scale resources as needed. Their data remains sovereign, and many new ideas and use cases are enabled in a way by which clients can easily scale up and down based on data throughput and volume requirements.

02
AI embraces agentic. Quantum on the horizon

High-value computing transforms Edge AI devices from passive data collectors to intelligent, autonomous entities. Agentic AI is continuously growing its capabilities to work autonomously in complex environments. We can imagine a world in which AI agents are actively updating code in real time with complex tasks broken down and solved quickly and efficiently, keeping humans in the loop to ensure governance. KPMG and IBM's ability to bring this to life in Edge AI use cases allows clients to take advantage of these new technologies in real-time scenarios that will be unmatched, especially with the looming emergence of Quantum Cloud and the QPU (Quantum Processing Unit).

03
Standards, protocols and frameworks

Standards, protocols, and frameworks play a crucial role in accelerating the widespread adoption of Edge AI computing by ensuring interoperability, security, and efficient deployment across diverse environments. Two notable examples are Agent2Agent (A2A) and Model Context Protocol (MCP), which, respectively, facilitate direct collaboration between autonomous AI agents operating on edge devices and standardize how AI models and contextual data are shared and managed across edge infrastructure. Further, through the watsonx portfolio and Edge Application Manager, IBM is helping businesses unlock the full potential of Edge AI computing by orchestrating AI workloads, managing data pipelines, and enforcing protocol compliance and framework adherence at scale.

04
Tech alliances for future networks

Edge AI and 5G wireless (and future 6G) require collaborative efforts to fully leverage their potential. The collaboration between IBM and KPMG exemplifies this. Each service complements the other by combining deep industry expertise with advanced technological solutions to help organizations drive innovation and operational efficiency. Other collaborations include cloud infrastructure companies partnering with telecommunications providers to accelerate the rollout of 5G-enabled edge computing solutions; cybersecurity firms teaming with AI specialists to deliver robust, and secure platforms that address emerging threats in increasingly distributed environments.

05
Balanced architecture and deterministic networks

Many organizations are expected to maintain a strong cloud presence while strategically leveraging Edge AI. The emphasis will be on reducing costs and managing risk by adopting balanced architecture. This approach may involve diversifying across edge, cloud, and data warehouse solutions, with DetNets-aligned data infrastructure experts helping to determine the optimal combination for each organization's unique needs.

How to start
your Edge AI computing journey

As Edge AI computing rapidly evolves, organizational leaders face both unprecedented opportunities and complex decisions. The following are actionable strategies designed to help your organization navigate and capitalize on the potential of Edge AI computing.

Invest now

Edge AI computing empowers your business to process data instantly at the source, enabling real-time decisions and responses that cloud-based systems simply can't match for emerging Agentic AI use cases. By acting now, you position your organization ahead of competitors still relying on legacy infrastructure—gaining the ability to address operational challenges as they arise, respond to security threats at the edge, and unlock new opportunities that emerge when analytics and action come together.

Leverage strategic partnerships

Leaders aiming to explore Edge AI computing, collaborating with experienced partners offers a powerful path forward. By joining forces with organizations that bring deep expertise in enterprise-scale AI and implementation, companies can accelerate innovation, improve operational efficiency, and achieve better results across diverse environments.

Focus on operational flexibility and agent-based systems

As organizations shift toward OpEx models, it is the ideal time to embrace improvements that enhance operational adaptability and leverage intelligent agents—especially within edge computing. Emerging standards are specifically designed to support seamless agent collaboration and data exchange at the edge, making widespread adoption more practical and secure.

Easier adoption, low upfront cost, and immediate ROI

Unlike other classical technologies, Edge AI computing does not demand a lengthy crawl-walk-run approach. Thanks to a lower upfront investment and agentic AI breakthroughs, organizations can embrace this innovative edge solution with fewer barriers, less capital commitment and greater confidence in their network edge infrastructure with more rapid returns.
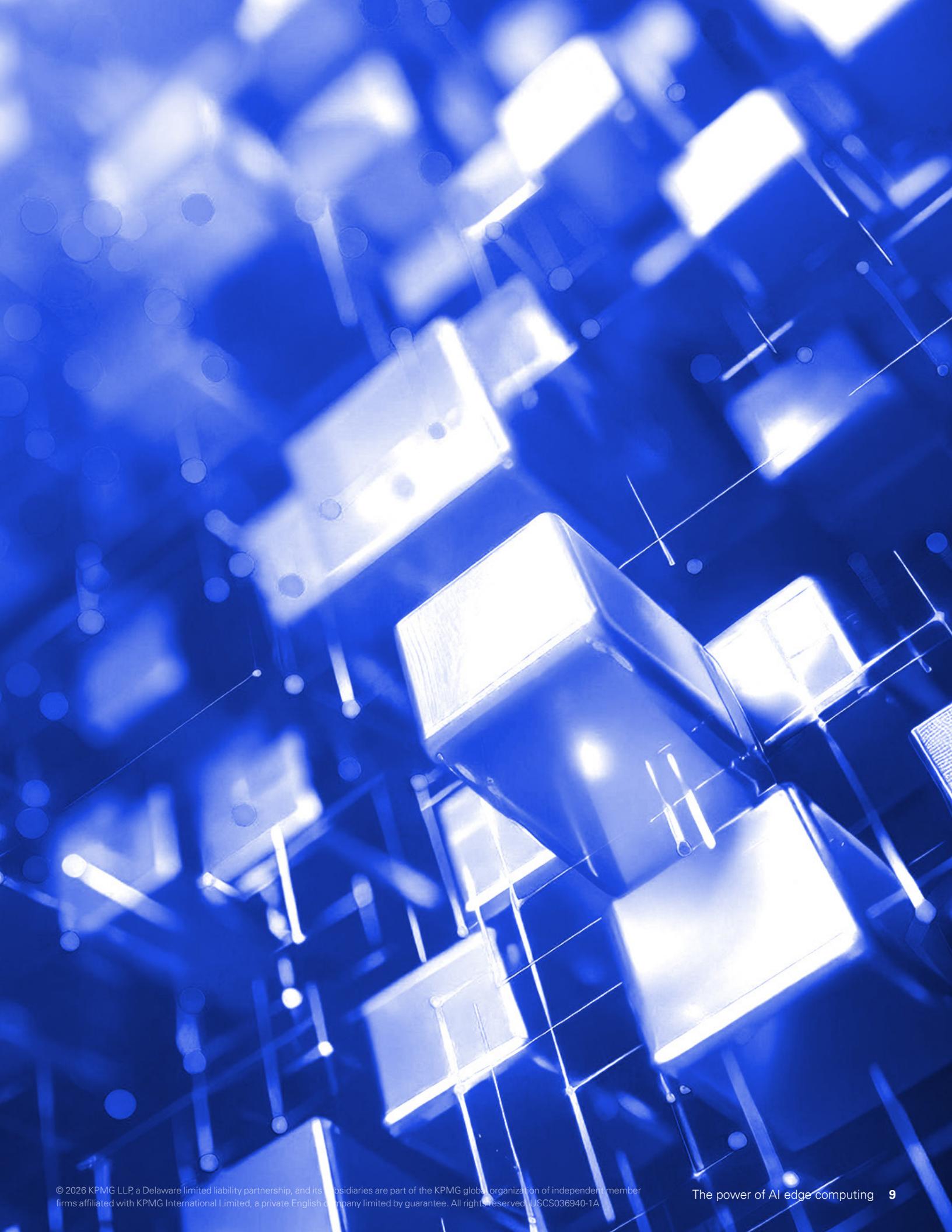
About IBM and KPMG

IBM is a leading provider of global hybrid cloud and AI, and consulting expertise. We help clients in more than 175 countries capitalize on insights from their data, streamline business processes, reduce costs, and gain a competitive edge in their industries.

KPMG is ranked #1 for quality AI advice and implementation in the US* and known for our Trusted AI frameworks, digital infrastructure development, financial advisory, and secure sovereign network technology implementations. We help our clients unlock competitive advantage through AI investments, Edge AI computing adoption, and strategic finance, delivering tailored solutions that drive efficiency, innovation, and measurable business impact.

Technological collaborations between IBM and KPMG are helping to usher in a promising new era of digital infrastructure, secure computing innovation and profitable use-cases. These opportunities can deliver high performance compute (GPU, CPU, QPU) at the nation's network edge, along with secure communications, sovereign (non-public) deterministic cloud networking, sustainable power specifications, encrypted data and inference capabilities all with zero latency speeds.

To learn more about Edge AI computing with IBM and KPMG, please contact:

Nate Gabig
Partner
Digital Infrastructure
& Finance, KPMG US

Madison Gooch
Vice President
watsonx
IBM Technology

*Perceptions of Consulting in the US in 2024, Source, May, 2024

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