

INTEGRATED SOLUTIONS INSIGHTS

/ CONNECT YOUR INFRASTRUCTURE TO POWER UP AI AT THE EDGE

By 2027, 62% of total data will be computed at or near the edge*.

As networks become more distributed and AI workloads increase, we're seeing a rise in AI at the edge. The maturation of GPUs (Graphics Processing Units) and the development of NPUs (Neural Processing Units) is allowing devices to dramatically enhance data processing. In turn, this can be used to process large data sets to initially train models and then deploy them for real-time inferencing, meaning that AI at the edge is starting to unlock powerful business advantages.

The adoption of AI is a journey, but one that is unstoppable and that businesses big and small will be considering at every stage of their development. Whether you are still at concept stage, starting to build AI into your planning, or have AI solutions deployed, Avnet Integrated Solutions, Microsoft and Dell can help you design, optimize, integrate, deploy and support your AI solutions, globally.

*Source: 451 Research's Edge Workload Total Addressable Market (TAM) Analysis, 2023; Voice of the Enterprise: Internet of Things, OT Perspective, Use Cases and Outcomes 2023.



**To supercharge data at the Edge,
you need an underlying strategy on
how to treat and leverage that data
and the insights it produces - along
with the systems and processes to
use it in real-time.**

/ WHAT'S IN GARTNER® HYPE CYCLE™ FOR AI 2024 REPORT?

Where to Start

Here's three scenarios where we believe the information in the Gartner® Hype Cycle™ can help.

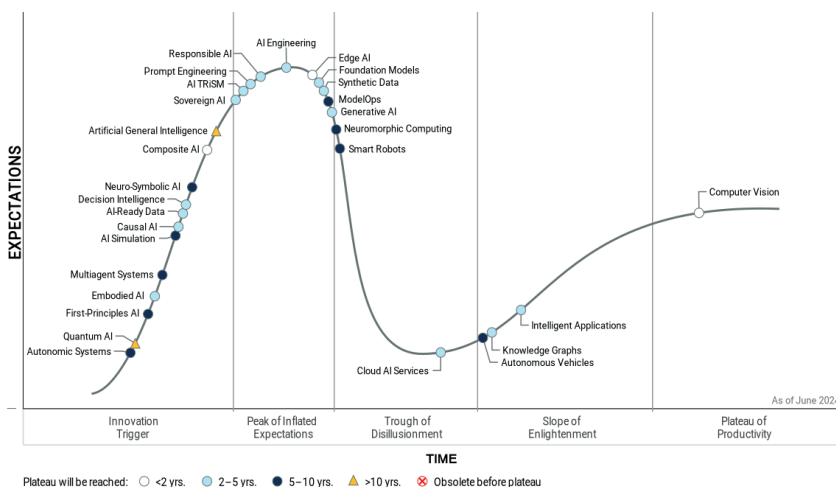
1. If you're just starting your AI journey then you're looking for where real business value is being realized to help you to organize and develop your solution.
2. In development of solutions with AI, the report can help you to understand if you're headed in the right direction and how you might optimize development and accelerate time to money.
3. If you're already moving forwards with your AI solutions the report can help to identify which use cases are emerging, and what development excellence looks like.

This document will provide some key developments from the updated Gartner® Hype Cycle™ for Artificial Intelligence 2024. The report covers all the central facets of AI and their position in the Hype Cycle. According to Gartner 'Investment in AI has reached a new high with a focus on generative AI, which, in most cases, has yet to deliver its anticipated business value.'



AI at the Edge: To leverage the full power of AI at the Edge and extract the maximum value from your data, you need a well-balanced and engineered system in action at the edge which can refine data in the cloud.

Hype Cycle™ for Artificial Intelligence 2024



Gartner.

What's a Gartner® Hype Cycle™ ?

When new technologies make bold promises, how do you discern the hype from what's commercially viable? And when will such claims pay off, if at all? Gartner® Hype Cycles™ provide a graphic representation of the maturity and adoption of technologies and applications, and how they are potentially relevant to solving real business problems and exploiting new opportunities. Gartner® Hype Cycle™ methodology gives you a view of how a technology or application will evolve over time, providing a sound source of insight to manage its deployment within the context of your specific business goals.



/ WHAT'S IN GARTNER® HYPE CYCLE™ FOR AI 2024 REPORT?

Priority Matrix for Artificial Intelligence, 2024

As we understand, the priority matrix is a different way to visualize where you should prioritize your efforts regarding the use cases that bring real business value and where you should lean in from a development perspective.

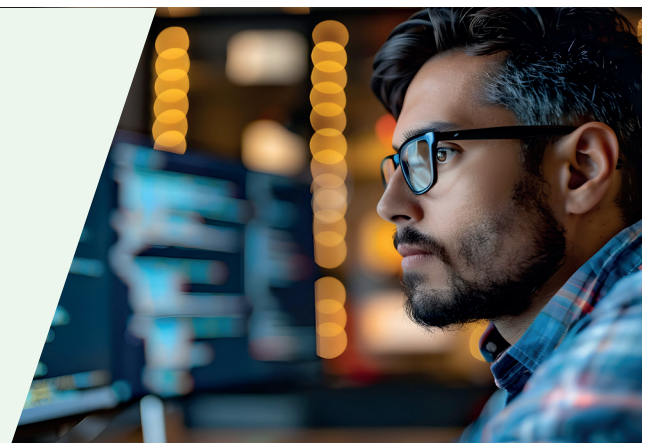
Benefit	Years to Mainstream Adoption			
	Less Than 2 Years	2 - 5 Years	5 - 10 Years	More Than 10 Years
Transformational	Composite AI Computer Vision	Decision Intelligence Embodied AI Foundation Models Generative AI Intelligent Applications Responsible AI	Autonomic Systems Autonomous Vehicles First-Principles AI Neuromorphic Computing	Artificial General Intelligence
High	Edge AI	AI Engineering AI-Ready Data AI TRISM Causal AI Cloud AI Services Knowledge Graphs Prompt Engineering Sovereign AI Synthetic Data	AI Simulation ModelOps Multiagent Systems Neuro-Symbolic AI Smart Robots	
Moderate				
Low				Quantum AI

Diagram taken from the Gartner® Hype Cycle™ for Artificial Intelligence 2024

“AI is going to be one of the trends that is going to be the next big shift in technology.”

Satya Nadella, CEO, Microsoft**

**[Source: <https://www.forbes.com/sites/bobevans1/2018/06/04/microsoft-ceo-satya-nadella-on-the-extraordinary-potential-of-ai/>]





/ KEY TRENDS IN AI IN 2024: A NEW ERA OF OPPORTUNITY AND COMPLEXITY

Here is our understanding of some of the key trends from the Gartner® Hype Cycle™ for Artificial Intelligence 2024 report.



The Rise of Generative AI - Everywhere:

The report underscores the massive surge in generative AI (GenAI) investment and its potential to revolutionize various fields. However, there is still caution as GenAI is still in its early stages, with concerns around its reliability, explainability, and ethical implications.



Composite AI:

The Future of AI: Gartner predicts that, within two years, composite AI - combined application (or fusion) of different AI techniques to improve the efficiency of learning to broaden the level of knowledge representations - will be the standard methodology for developing AI systems, and to be widely adopted. This emphasizes the importance of using a diverse range of AI methods to address complex business challenges.



Growing importance of Edge AI:

Gartner notes that, 'Increasingly, generative models (including smaller language models) have become an area of experimentation and investment.' Further, 'Many edge computing use cases are latency-sensitive and data-intensive and require autonomy for local decision making.'



Computer vision:

The only AIs with 'Transformational' benefits in less than 2 years are composite AI and computer vision. Increasingly used in applications across retail, healthcare and industrial automation, adoption of computer vision has exploded.



/ KEY TRENDS IN AI IN 2024: A NEW ERA OF OPPORTUNITY AND COMPLEXITY (CONTINUED)



Development challenges

- **AI Engineering:** A new discipline, AI engineering, is emerging to manage the complex process of building, deploying, and maintaining AI systems across diverse environments and technologies.
- **Data Management:** The report stresses the crucial need for robust data management practices tailored for AI. This includes preparing high-quality, AI-ready data, managing data biases, and ensuring data security and privacy.
- **ModelOps:** Organizations are increasingly relying on model operationalization (ModelOps) to manage AI models throughout their lifecycle. This involves standardization, scalability, and governance of AI models across various environments and phases of development.
- **Responsible AI (RAI):** The report emphasizes the importance of RAI as a key principle for ethical AI development and use. RAI addresses concerns around fairness, bias, explainability, security, privacy, and regulatory compliance.

Key Takeaways:

- **Strategic planning essential:** Gartner emphasizes the need for organizations to develop clear AI strategies, focusing on responsible development, data management, and robust model operations.
- **Collaboration is crucial:** Success in AI requires collaboration across teams with diverse skills and expertise, including data scientists, domain experts, engineers, and business leaders.
- **Embrace a composite AI approach:** Combining different AI techniques allows for more flexible, robust, and effective solutions.
- **Stay ahead of the curve:** Organizations need to keep abreast of emerging developments.

/ EDGE AI: UNLEASHING THE POWER OF AI AT THE EDGE

The Gartner® Hype Cycle™ for Artificial Intelligence 2024 highlights the rising importance of Edge AI.

How can you use AI at the Edge?

Partnering for Success with Avnet Integrated, Dell, and Microsoft

Depending on the solution you are looking to develop, AI at the edge can bring a multitude of new benefits to traditional products. Edge AI unlocks more efficient methods of software development, data organization, inferencing and decision-making, and iterative training. OEM customers can leverage the combined expertise and partnership between Avnet, Microsoft and Dell, to bring your products to life, help you develop, test, learn and then build, distribute and support you, globally.



01. Create

From your first concepts, Avnet in collaboration with Microsoft can help ideate on what foundational hardware and software solutions will maximize your business value.



03. Build and power with sustainable hardware

Dell's OEM solutions specifically designed for edge computing, provide hardware and software optimized for AI workloads. This includes a wide range of platforms, from servers and storage to networking and edge computing devices. Avnet then purpose builds your solution, integrating your customer hardware configurations and application software, testing and then shipping your solution globally.



02. Accelerate, develop and learn

Microsoft's Azure Stack Edge provides a powerful platform for developing AI and ML models on edge devices. Organize your data in the cloud, train your models and run simulations in a safe and contained environment. Additionally, as the leading operating software choice for OEMs, with more data centers globally than anyone else, Microsoft has put security and reliability at the heart of their solutions to power AI.



04. Launch, scale, deploy and support

Avnet Integrated Solutions, as the leading partner in the technology supply chain can help you deliver, install and service your solutions globally enabling you to focus on extending your IP advantage and driving demand.

/ WORKING WITH DELL AND MICROSOFT WE CAN OFFER

Dell's Edge Computing Solutions



Optimized Hardware:

Dell provides customizable solutions that allow you to tailor hardware and software configurations to meet specific business needs. These solutions are scalable, making it easy for businesses to grow and adapt without needing to replace infrastructure.



Advanced Security and Data Management:

Dell's solutions focus on security, with built-in features like data encryption and secure boot processes. This allows you to handle data securely at the edge, ensuring regulatory compliance and reducing risks in decentralized environments.

Dell offers extensive knowledge around practical solutioning and use cases that offer real business value.

Microsoft's Azure Stack Edge and Windows IoT



Scalable Cloud-Edge Platform:

Utilize Microsoft's Azure cloud services including Azure Stack Edge to develop, optimize and run AI and ML workloads on edge devices or in a hybrid cloud approach allowing for maximum performance, scalability, and flexibility.



Simplified Management:

Use Azure Stack Edge to simplify the management of your Edge AI infrastructure, with features like data security, monitoring, and orchestration.



Scale Efficiency:

Microsoft Windows IoT provides the necessary real time processing for Edge application while providing seamless integration with Microsoft's cloud services enabling a highly optimized, secure, and flexible solution to maintain and grow.

/ UNLOCKING THE BENEFITS OF EDGE AI

By bringing AI to the edge, businesses can:

- **Improve operational efficiency:** Edge AI can optimize manufacturing processes by identifying defects, wasted motion, and overproduction in real-time. This reduces costs and improves efficiency. It can also help with decision-support and maintenance at the network edge.
- **Enhance customer experience:** Edge AI enables real-time data analysis, allowing for personalized experiences, such as tailored product recommendations or proactive customer support through feedback mechanisms in AI products.
- **Reduce connectivity costs:** Edge AI minimizes the amount of data that needs to be transmitted to the cloud, lowering connectivity costs and improving network performance. Storage costs may also be reduced as only priority information is passed back to core systems.
- **Preserve data privacy:** By processing data locally, Edge AI helps organizations comply with data privacy regulations and maintain control over sensitive information.

/ UNLOCKING THE BENEFITS OF EDGE AI (CONTINUED)

By collaborating with Avnet, Dell, and Microsoft, you gain access to a comprehensive set of resources and expertise, enabling them to:

- **Simplify edge operations at scale:** We can help you design and deploy efficient and agile systems that work together.
- **Optimize data management:** Microsoft's expertise in data management, coupled with Dell's solutions for data storage and network connectivity, helps to ensure the security, integrity, and accessibility of data on the edge.
- **Address hardware constraints:** Dell's optimized hardware and Azure Stack Edge's edge computing capabilities address the challenges of limited processing power and resource constraints often faced in Edge AI deployments.
- **Leverage advanced Edge AI capabilities:** Microsoft's Azure Stack Edge empowers OEMs to deploy and manage a wide range of AI and ML models on edge devices, including smaller generative language models that can improve performance and privacy.

We can help you leverage the power of Edge AI to gain a competitive advantage, accelerating time to market, reducing costs, and enhancing customer satisfaction.

So, What's Next?

Capitalize on Edge AI opportunities by partnering with Avnet and leveraging solutions from Dell and Microsoft. We bring:

- **Accelerated time to market:** Our deep expertise in the technology supply chain can help bring Edge AI solutions to market faster. We offer a comprehensive range of tested products and services from best-of-breed suppliers.
- **Streamlined integration:** Leverage our expertise to seamlessly integrate Edge AI solutions with existing systems and platforms, minimizing integration complexity and time.
- **Financial expertise:** Benefit from Avnet's financial expertise to execute financial transactions and optimize capital investment for your Edge AI projects. With our Direct Connect solution we can manage financial transactions for your clients too.

“The real opportunity is to reimagine your organization and what you can become given the superpowers AI unleashes.”

Michael Dell, CEO, Dell Technologies[†]

[†](Source: <https://www.crn.com/news/channel-news/michael-dell-use-ai-superpowers-to-reimagine-your-organization>)



/ PURPOSE-BUILT HARDWARE-AS-A-SERVICE WITH AZURE STACK EDGE

Companies of all sizes are turning to Microsoft for innovative, secure, and responsible AI services. Microsoft provides full-stack AI solutions including developer tools, application services, and supercomputing infrastructure built specifically for AI, plus a global team of AI experts that can help organizations accelerate their AI production.

You can run your workloads and get quick actionable insights right at the edge where data is created using purpose-built hardware-as-a-service with Azure Stack Edge, which offers enterprise scale and performance for your edge workloads.

Choose the best device for the job from our Azure Stack Edge Pro Series.

Pro 2

Compact form factor optimized for edge and branch locations. Flexible mounting options. Configuration options:

- 32 vCPUs, 51 GB RAM, 720 GB
- 32 vCPUs, 102 GB RAM, 1.6 TB, 1 NVIDIA A2 GPU
- 32 vCPUs, 204 GB RAM, 2.5 TB, 2 NVIDIA A2 GPUs



Pro

1U rack-mountable appliance, optimized for conditions inside a data center or branch location. Configuration options:

- 40 vCPUs, 102 GB RAM, 4.2 TB, 1 NVIDIA T4 GPU
- 40 vCPUs, 102 GB RAM, 4.2 TB, 2 NVIDIA T4 GPUS



Pro R

Ruggedized datacenter-grade power with a built-in NVIDIA T4 GPU, in a transportable case for remote locations.

Available options: With or without Uninterruptable Power Supply (UPS).



Azure Stack Edge Mini Series - Designed for edge processing on the go.

Mini R

Ruggedized, battery-operated device-small enough to fit into a backpack-designed for harsh environments and disconnected scenarios. Includes a built-in Intel VPU for edge processing.



/ BUILD A SECURE, SCALABLE AND CUSTOMIZABLE SERVER APPLIANCE WITH OEM POWEREDGE SERVERS

Dell PowerEdge Rack Servers

Offering optimal balance in compute and memory. The rack server is a hard working platform, delivering storage, I/O, and application acceleration balanced with configuration flexibility.



Dell PowerEdge Tower Servers

Designed to grow with you. Reliable, scalable, and easy to manage, our tower servers are designed for your specific applications and are ideal for remote and branch office locations.



Dell PowerEdge Modular Servers

Ultimate compute flexibility. Dell's modular platforms are designed to support the right balance of density, capacity, and flexibility using either traditional or cloud-native workloads.



Dell PowerEdge XR Servers

Compute at the Edge. Servers in the XR series are purpose-built from the ground up with the edge in mind.



Don't waste time!

Building Edge AI solutions is a race to market. Talk to Avnet today about how we can help you get from design to scale. Contact us at integrated@avnet.com.

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