



Helping you bring your IP to market faster on world-class technologies

INTEGRATED SOLUTIONS INSIGHTS

/ HOW YOU CAN GAIN COMPETITIVE ADVANTAGE WITH ARTIFICIAL INTELLIGENCE

As an OEM, you know that getting your products to market faster helps you realize a quicker return on investment. By using these insights, you'll learn how to adapt your products for the future and maximize the benefits that AI can bring. Plus, you'll discover how Integrated Solutions and Supermicro can support you on your AI journey.

Artificial intelligence, energized by the practical developments with generative AI, are set to change the way we work forever. We've already provided you with the "Gartner® Hype Cycle™ for Artificial Intelligence 2023 report." If you haven't had a chance to decode the full report, this is designed to highlight key value points.

Here, we'll focus on generative AI – one of the key areas Gartner calls out as transformational. If you are looking to gain a competitive edge now and in the coming years, directing your attention to generative AI is imperative. We'll break down what it is, why it matters, what's driving the hype, and what to consider during solution implementation.

The innovations that will be fueled by generative AI include:

- Autonomic systems
- Edge AI
- Intelligent applications
- Cloud AI services
- Computer vision

While the full Hype Cycle details not only the drivers and obstacles across a whole range of AI applications, it also offers key recommendations on how to move forward with each of them. Examples are given showing which technologies are most applicable in which industries, so you can get ahead of the game, building competitive advantage and resilience into your business before the rest of the industry catches up.

AI In Supply Chain Management

"Being at the center of the supply chain means Avnet has a lot of access to data from our customers and our suppliers. We can take our 30-plus years of data and layer on market trends. Using AI, we're able to infer that when the market did this, that is what happened with our customers and suppliers. Now we can connect those trends and project forward to predict demand."



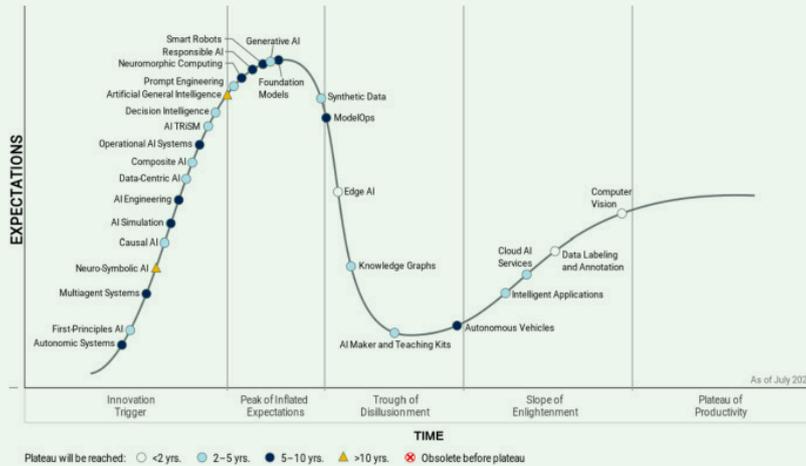
Rebeca Obregon

President, Global Farnell & Integrated Solutions



What's in Gartner® Hype Cycle™ for Artificial Intelligence 2023 report?

Hype Cycle for Artificial Intelligence, 2023



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.

As seen in the illustration, the 2023 Gartner® Hype Cycle™ for Artificial Intelligence (AI) highlights the critical AI technologies and trends anticipated to exert substantial influence on businesses over the next 5-10 years.

Some of the key trends highlighted in the Hype Cycle include:

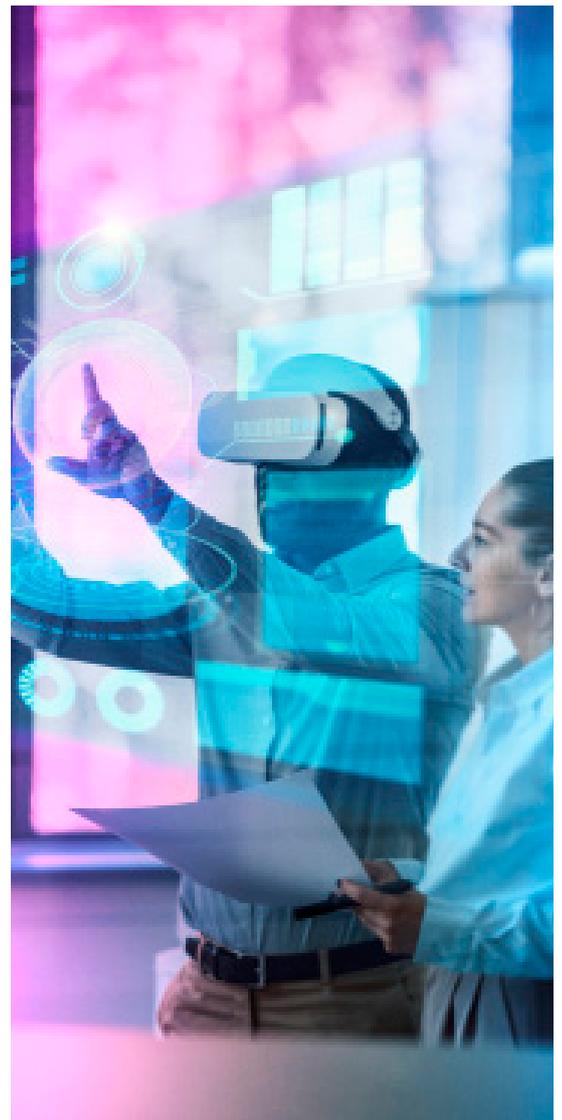
Generative AI: Generative AI is a type of AI that can create new data or content, such as images, text, or music. This technology is still in its early stages, but it has the potential to revolutionize a wide range of industries, such as healthcare, manufacturing, and entertainment.

Causal AI: Causal AI is a type of AI that can understand the cause-and-effect relationships between different variables. This technology can be used to improve decision-making, identify risks, and optimize processes.

Autonomous systems: Autonomous systems are self-managing systems that can operate without human intervention. These systems are becoming increasingly common in a variety of applications, such as self-driving cars and drones.

Edge AI: Edge AI is a type of AI that is deployed on devices at the edge of the network, such as smartphones and IoT devices. This allows AI to be used in real-time and in remote locations.

Gartner suggest to balance high value propositions with those that are more readily available within packaged solutions, such as computer vision, smart robots, and AI cloud services. Of course, the value of some technologies will be higher to your own business and will be able to confer advantage for you, with an early investment. We're already working with customers on projects in market segments like healthcare and retail for applications using video and AI learning.



Gartner® Hype Cycle™ for Artificial Intelligence 2023 report

We've summarized some key points about Generative AI from the Gartner® Hype Cycle™ for Artificial Intelligence report for you here. You can get your complimentary copy of the full report direct from Avnet Integrated.



Gartner Benefit Rating: Transformational
Market Penetration: 1% - 5% of target audience
Maturity: Adolescent

Generative AI technologies create new content by learning from large sources of original content. It is likely to have a huge impact on the automation of human work, especially across customer and employee experiences. Exploration of this space is accelerating thanks to ChatGPT, Stable Diffusion, Midjourney and large language models. Most technology products and services will incorporate generative AI capabilities in the next 12 months. However, it will also likely become a threat when used for nefarious purposes and so responsible AI will be necessary to provide the trust and security for generative AI to be safely exploited.

Drivers

- Hype is accelerating and new foundation models are coming to market which can combine concepts, creating original images, video, and art from text or translating audio to different voices and languages.
- Machine learning and natural language processing platforms are adding generative AI capabilities to encourage reusability.
- Industry applications are growing in key sectors like healthcare (depicting disease development through imagery), retail (helping customers virtually try on clothes and makeup), product development (through digital twins) and life sciences (to speed up drug development).
- Combined with development automation, it is expected that generative AI will automate up to 30% of the work of software programmers.

Obstacles

- Governments globally are starting to work on inputs for AI safety following ethical and societal concerns.
- Hallucinations and factual errors are still found in work generated by AI. Low awareness of these and from security professionals could cause incidents which undermine adoption.
- Generative AI can be easily corrupted for nefarious purposes including the generation of deepfakes and it is challenging to detect when content has been faked.
- The compute resources for training large, general-purpose foundation models are heavy and not affordable to most enterprises.

Recommendations

- Identify use cases where you can improve your solutions with generative AI by relying on purchased capabilities or partnering with specialists.
- Pilot machine learning-powered coding assistants to maximize developer productivity.
- Use synthetic data to accelerate the development cycle and lesson regulatory concerns.
- Quantify the advantages and limitations of generative AI. Weigh technical capabilities with ethical factors and beware of subpar offerings.
- Mitigate risk by working with legal, security, and fraud experts and start with data security guidelines.

So, What's Next?

To maximize the opportunity around AI, you need to understand how to:

1. **Quickly** and efficiently build AI into your current products and your product roadmap at the design stage of the process.
2. **Next**, get help identifying the best solutions in terms of hardware, software and supply chain to help you deliver those designs.
3. **Finally**, get your products out to the widest possible market and manage the distribution, delivery and financing as efficiently as possible.

Avnet can help. We're your partner for every stage of the process. By partnering with us you can save time, cost and remove complexity. We work with best-of-breed suppliers in every area an OEM needs and have years of experience across all the core markets.

We can provide tested products and solutions which can be built, installed and serviced across the globe. We can take out unnecessary cost and get you to market faster, allowing you to capitalize on the AI solutions we've developed together, quickly. We can even help you leverage your capital by executing the financial transactions for your clients, too.

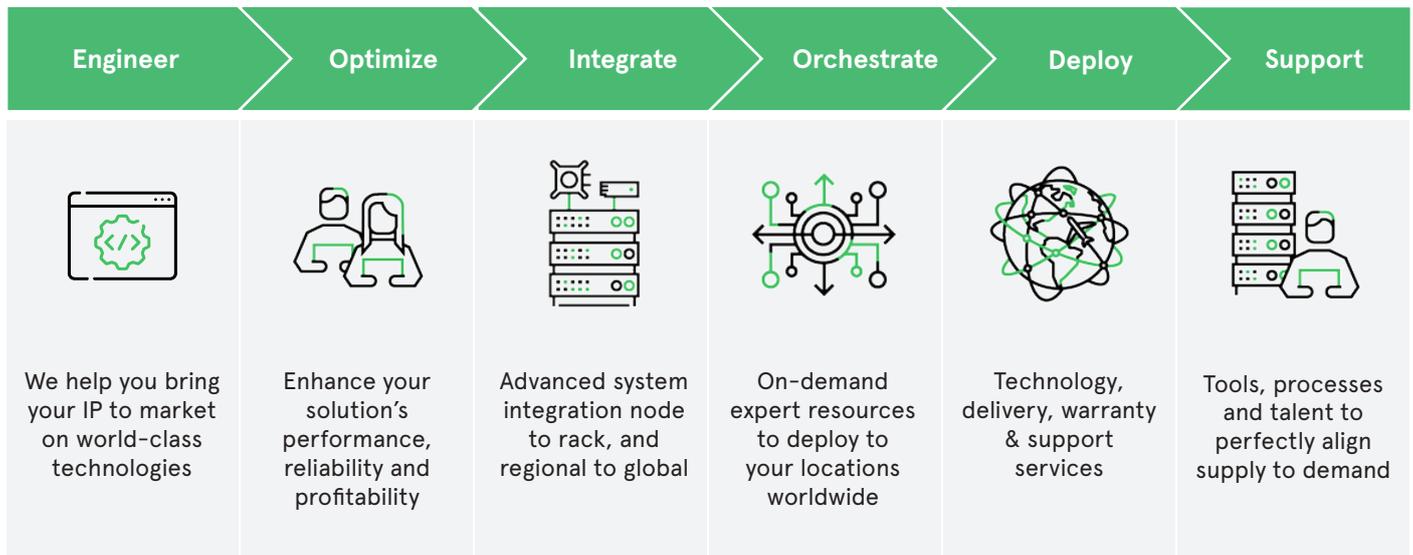
"Now that AI is becoming pervasive, Supermicro continues to be committed to being the industry leader in creating the most performant and energy efficient systems from the data center to the edge. We aim to bring a world-class infrastructure broadly available to organizations of all sizes for many large enterprises and super scale CSPs."



Charles Liang,
President and CEO of Supermicro



Design to Scale



Alongside Supermicro, Avnet can support OEM customers who are managing the challenges of continuous data growth, as well as the demands for high performance across GPUs, memory, storage and networks.

Current use cases include the development of Large Language Models (LLMs), autonomous driver training and recommender systems.

With a portfolio of workload-optimized systems for optimal GPU performance and efficiency across a broad spectrum of demands, between us we can offer the products and support you need.

Technology To Support AI Projects from Avnet Integrated and Supermicro

Large Scale AI Training Workloads

Use cases

- Large Language Models (LLMs)
- Autonomous driving training
- Recommender systems



AI Rack Solutions

Opportunities and challenges

- Pool of 10,000+ GPUs and GPU memory to fit large AI models to maximize parallel computing and minimize training time.
- Training with massive amount of data with continuous growth of data size (e.g. over 1 trillion tokens).
- Serve AI models (inference) to millions of concurrent users.
- High performance everything: GPUs, memory, storage, and network fabric.



HGX H100 Systems

HPC/AI Workloads

Use cases

- Manufacturing and engineering simulations (CAE, CFD, FEA, EDA)
- Bio/life sciences (genomic sequencing, molecular simulation, drug discovery)
- Scientific simulations (astrophysics, energy exploration, climate modeling, weather forecasting)



HGX H100 Systems

Opportunities and challenges

- Augmenting machine learning algorithms and GPU accelerated parallel computing to HPC workloads to achieve faster results and discoveries.
- Parallel processing with massive datasets for data-intensive simulations and analytics.
- Simulations requiring double precision (FP64)
- High-resolution and real-time visualization of scientific simulations and modeling.



1U Grace Hopper MGX Systems

Enterprise AI Inferencing & Training

Use cases

- Content creation (image, audio, video, writing)
- AI-enabled office applications and services
- Enterprise business process automation



10 GPU Systems

Opportunities and challenges

- AI adoption across industries to boost productivity, streamline operations, make data-driven decisions, and improve customer experience.
- Open architecture, vendor flexibility, fast/easy deployment for rapidly evolving technologies
- High computational and resource costs, cloud vs. on-prem
- Utilization of frameworks, pre-trained models, open-source AI models with fine-tuning



2U MGX System

Visualization and Omniverse Workloads

Use cases

- Game development
- Product design
- City planning/architectural
- Digital twins (manufacturing, assembly lines, logistics)



Omniverse Optimized Systems

Opportunities and challenges

- AI-aided 3D graphics, game development, creative asset generation
- Digitizing industrial design and productization process with virtualized real-world scenarios
- Integrated engineering and enterprise-scale simulations
- Cloud and virtual collaboration with low latency



Workstations



Let's talk!

Building AI into your products now is a race to the market to get the best advantage and maximize your opportunity. Don't waste time – speak to one of our team now about how we can help you get from design to scale, starting today. Contact us on integrated@avnet.com to make the first move.

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