What's New in the 2023 Gartner Hype Cycle for Emerging Technologies

August 23, 2023

Contributor: Lori Perri

They fit into four main themes: emergent AI, developer experience, pervasive cloud, and human-centric security and privacy.

Explore the Latest: 2024 Gartner Hype Cycle™ for Emerging Technologies (/en/articles/hype-cycle-for-emerging-technologies)

The 2023 Gartner Hype Cycle identifies 25 must-know emerging technologies designed to help enterprise architecture and technology innovation leaders:
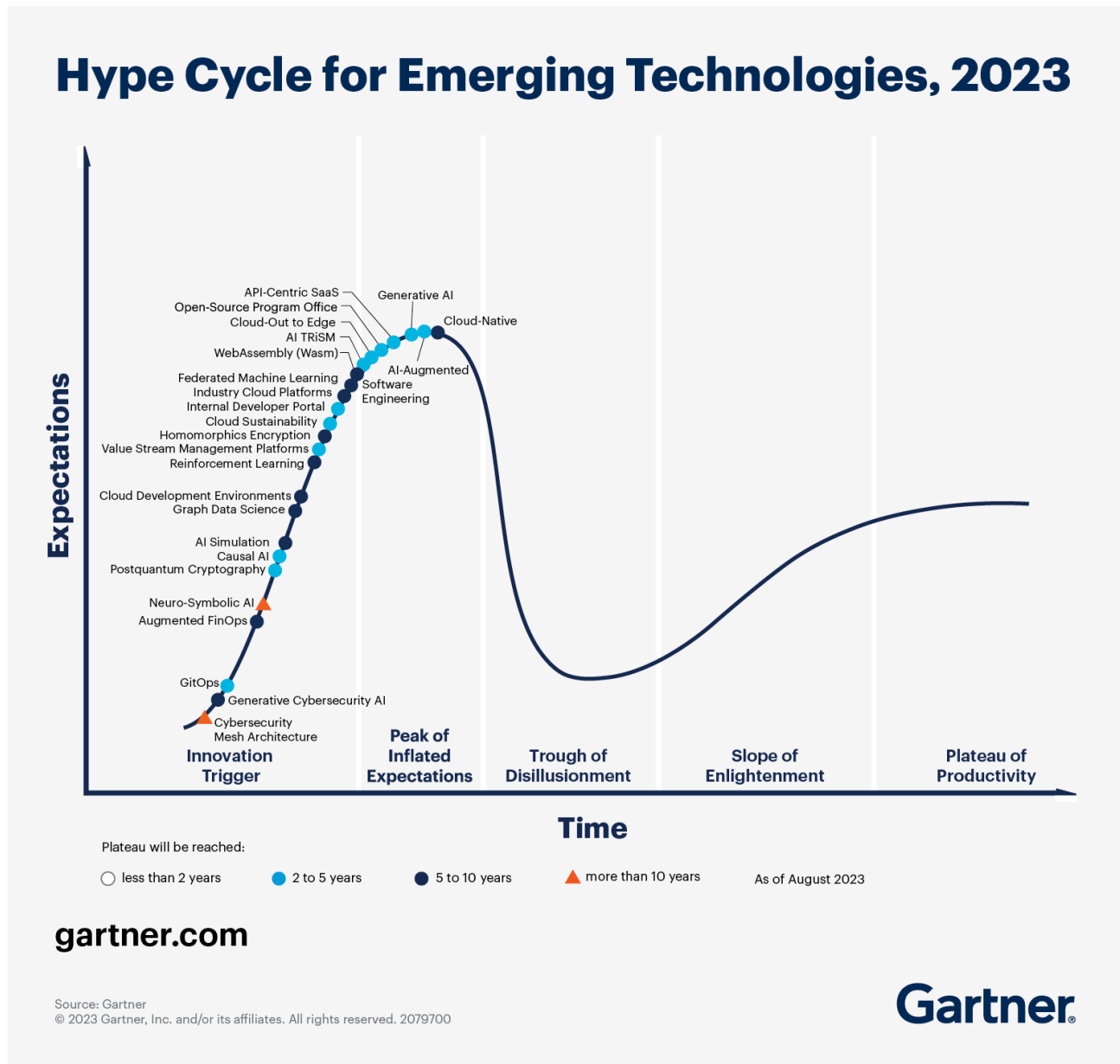
- **Evaluate** the business impact of emerging technologies

- **Examine** and explore potentially transformative technologies

- **Strategize** how to benefit from these technologies

These technologies are expected to greatly impact business and society over the next two to 10 years, and will especially enable CIOs and IT leaders to deliver on the promise of digital business transformation.

Download Now: 2024 Technology Adoption Roadmap for Key Emerging Technologies (/en/information-technology/technology-adoption-roadmap)

Because emerging technologies are disruptive by nature, it's critical to understand the potential use cases and paths to mainstream adoption.

"The technologies in this **Hype Cycle (/en/research/methodologies/gartner-hype-cycle)** are at an early or embryonic stage," says Gartner Distinguished VP Analyst Arun Chandrasekaran. "Great uncertainty exists about how they will evolve, so there are greater risks for deployment, but potentially greater benefits for early adopters."

Hype Cycle for Emerging Technologies, 2023

- API-Centric SaaS
- Open-Source Program Office
- Cloud-Out to Edge
- AI TRiSM
- WebAssembly (Wasm)
- Generative AI
- Cloud-Native
- AI-Augmented Software Engineering
- Federated Machine Learning
- Industry Cloud Platforms
- Internal Developer Portal
- Cloud Sustainability
- Homomorphics Encryption
- Value Stream Management Platforms
- Reinforcement Learning
- Cloud Development Environments
- Graph Data Science
- AI Simulation
- Causal AI
- Postquantum Cryptography
- Neuro-Symbolic AI
- Augmented FinOps
- GitOps
- Generative Cybersecurity AI
- Cybersecurity Mesh Architecture

Expectations

Time

Innovation Trigger | Peak of Inflated Expectations | Trough of Disillusionment | Slope of Enlightenment | Plateau of Productivity

Plateau will be reached:
○ less than 2 years   ● 2 to 5 years   ● 5 to 10 years   ▲ more than 10 years   As of August 2023

gartner.com

Gartner

(https://emt.gartnerweb.com/ngw/globalassets/en/articles/images/2023-gartner-hype-cycle-for-emerging-technologies.png)

Four Gartner Hype Cycle themes to think about in 2023 and beyond

Theme No. 1: Emergent AI

These technologies provide opportunities for sustainable differentiation and greater workforce productivity. While **generative AI (/en/insights/generative-ai-for-business)** has great potential to enable competitive differentiation, several other emerging **AI (https://www.gartner.com/en/topics/artificial-intelligence)** techniques also offer immense potential to **enhance digital customer experiences (/en/information-technology/topics/digital-transformation)**, make better business decisions and distinguish yourself among your competition.

An example of **emergent AI (/en/topics/artificial-intelligence)**, generative AI can generate new derived versions of content, strategies, designs and methods by learning from large repositories of original source content. It will continue to have profound business impacts, including on content and product development; automation of human work; and in enhancing **customer (/en/customer-service-support/trends/customer-service-ai-use-case-prism)** and **employee experiences (/en/human-resources/topics/artificial-intelligence-in-hr)** as it reaches mainstream adoption in two to five years.

Other critical technologies in emergent AI include:

- **AI simulation** is the combined application of AI and simulation technologies to jointly develop AI agents and the simulated environments in which they can be trained, tested and sometimes deployed.

- **Causal AI** identifies and uses cause-and-effect relationships to go beyond correlation-based predictive models and toward AI systems that can prescribe actions more effectively and act more autonomously.

- **Federated machine learning** aims to train a machine learning algorithm without explicitly sharing data samples, enabling better privacy and security.

- **Graph data science (GDS)** is a discipline in which data science techniques are applied to graph data structures to identify behavioral characteristics that can be used to build predictive and prescriptive models.

- **Neuro-symbolic AI** is a form of composite AI that combines machine learning (ML) methods and symbolic systems to create more robust and trustworthy AI models.

- **Reinforcement learning (RL)** is a type of ML where the learning system receives training only in terms of positive feedback (rewards) and negative feedback (punishments).

Theme No. 2: Developer experience (DevX)

Enhancing developer experience is critical for most enterprises. The suite of technologies under this theme focuses on **attracting and retaining top engineering talent (/en/software-engineering/topics/software-engineering-talent)** by supporting interactions between developers and the tools, platforms, processes and people they work with.

Value stream management platform (VSMP) is an example of DevX technology that seeks to optimize end-to-end product delivery and improve business outcomes. VSMPs are typically tool-agnostic. They connect to existing tools and ingest data from all phases of software product delivery — from customers' needs to value delivery. VSMPs help software engineering leaders identify and quantify opportunities to improve software product performance by optimizing cost, operating models, **technology and processes (/en/software-engineering/topics/software-architecture-technologies)**. Value stream management platforms will take two to five years to achieve mainstream adoption.

Other critical technologies in developer experience include:

- **AI-augmented software engineering**, the use of AI technologies and natural language processing (NLP) to help software engineers create, deliver and maintain applications.

- **API-centric SaaS**, a cloud application service designed with programmatic request/reply or event-based interfaces (APIs) as the primary methods of access.

- **GitOps**, a type of closed-loop control system for cloud-native applications.

- **Internal developer portals**, which enable self-service discovery and access to resources in complex, cloud-native software development environments.

- **Open-source program office (OSPO)**, the center of competency to build strategies for governing, managing, promoting and efficiently using open-source

software (OSS) and open-source data or models.

Theme No. 3: Pervasive cloud

These technologies focus on how **cloud computing (/en/topics/cloud-old)** will evolve and become an important driver of business innovation. They are reimagining the cloud at the edge, making it more vertically integrated and enabling industry-relevant solutions. Maximizing value from cloud investments will require automated operational scaling, access to cloud-native platform tools and adequate governance.

Industry cloud platforms exemplify pervasive cloud, and address industry-relevant business outcomes by combining underlying SaaS, PaaS and IaaS services into a whole product offering with composable capabilities. These typically include an industry data fabric, a library of packaged business capabilities, composition tools and other platform innovations. IT leaders can use the composability of these platforms to be adaptable and agile in response to accelerating disruption. They will take five to 10 years to reach mainstream adoption.

Other critical technologies in pervasive cloud include:

- **Augmented FinOps**, which applies the traditional DevOps concepts of agility, continuous integration and deployment, and end-user feedback to financial governance, budgeting and cost optimization efforts.

- **Cloud development environments (CDEs)**, providing remote, ready-to-use access to a cloud-hosted development environment with minimal effort for setup and configuration.

- **Cloud sustainability**, the use of cloud services to achieve **sustainability benefits (https://www.gartner.com/en/insights/sustainable-business)** within economic, environmental and social systems.

- **Cloud-native**, which refers to something created to optimally leverage or implement cloud characteristics that are part of the original definition of cloud computing, and include capabilities delivered as a service.

- **Cloud-out to edge**, an architectural construct where a centrally managed cloud environment, typically a hyperscale cloud, provides cloud service capabilities that are extended to edge environments.

- **WebAssembly (Wasm)**, a lightweight virtual-stack machine and binary code format designed to support secure, high-performance applications on webpages.
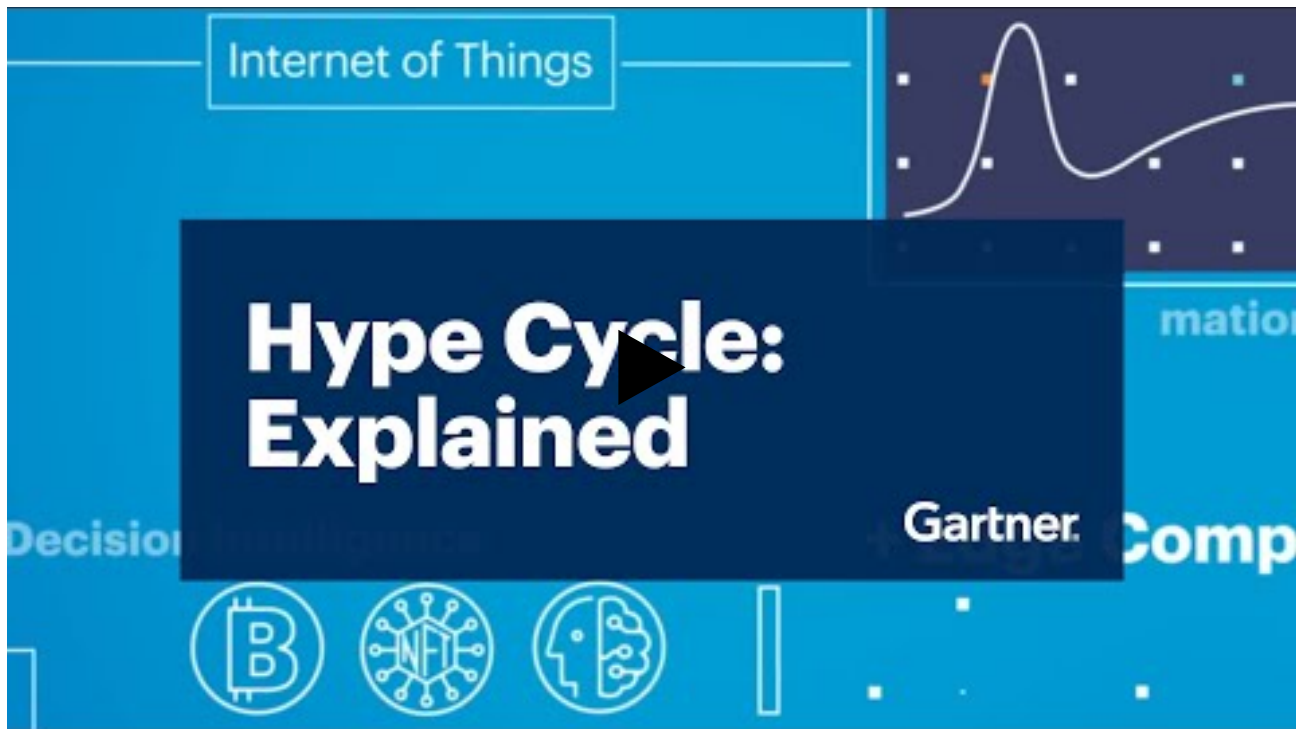
Theme No. 4: Human-centric security and privacy

The technologies in this bucket focus on how organizations can become resilient by implementing human-centric security and privacy programs. They enable enterprises to create a culture of mutual trust and awareness of shared risks in decision making between many teams.

AI trust, risk and security management (AI TRiSM) (/en/articles/what-it-takes-to-make-ai-safe-and-effective) is a great example of human-centric security and privacy and ensures AI model governance, trustworthiness, fairness, reliability, robustness, efficacy and data protection. It includes solutions and techniques for model interpretability and explainability, data and content anomaly detection, AI data protection, model operations and adversarial attack resistance. It will take two to five years to achieve mainstream adoption.

Other critical technologies in human-centric security and privacy include:

- **Cybersecurity mesh architecture (CSMA)**, an emerging approach for architecting composable, distributed security controls that improve overall security effectiveness.

- **Generative cybersecurity AI**, which generates new derived versions of security-related and other relevant content, strategies, designs and methods by learning from large repositories of original source data.

- **Homomorphic encryption (HE)**, which uses algorithms to enable computations with encrypted data and enables businesses to share data without compromising privacy.

- **Postquantum cryptography (PQC)**, also called quantum-safe cryptography, algorithms designed to secure against both classical and quantum-computing attacks.

Arun Chandrasekaran (/en/experts/arun-chandrasekaran) is Distinguished Vice President Analyst who focuses on providing strategic advice to CTOs and CIOs on how to spur technology innovation within enterprise IT.

Experience CIO and IT Executive conferences

Join your peers for the unveiling of the latest insights at Gartner conferences.

View Conferences (https://www.gartner.com/en/conferences/calendar/cic

🔒 **Recommended resources for Gartner clients*:**

Hype Cycle for Emerging Technologies, 2023 (https://www.gartner.com/document/4597499?toggle=1&viewType=Full)
Understanding Gartner's Hype Cycles (https://www.gartner.com/document/code/793868? ref=ddisp&refval=793868)

*Note that some documents may not be available to all Gartner clients.

Get Exclusive Content

Focus Areas for CIOs: What Good Looks Like in 2025
Read Now ↗
(/en/articles/focus-areas-for-cios)

Gain Stakeholder Buy-In With These Cybersecurity Best Practices
Read Now ↗
(/en/articles/cybersecurity-value)

5 IT Financial Management Fundamentals for CIOs to Drive IT Success
Register for Webinar ↗
(/en/webinar/739305/1668737-5-it-financial-management-fundamentals-for-cios-to-drive-it-success)

Subscribe to the Latest Insight

Work Email

⊘

Continue

🔒

By clicking the "Continue" button, you are agreeing to the **Gartner Terms of Use (/en/about/policies/terms-of-use)** and **Privacy Policy. (/en/about/policies/privacy)**

Explore deep-dive content to help you stay informed and up to date

5 IT Financial Management Fundamentals for CIOs to Drive IT Success

Register for Webinar ↗ (/en/webinar/739305/1668737-5-it-financial-management-fundamentals-for-cios-to-drive-it-success)

CIO Power Tactics to Win IT Strategic Plan Support

Register for Webinar ↗ (/en/webinar/739876/1670325-cio-power-tactics-to-win-it-strategic-plan-support)

The Art of the 1-Page Strategy – 4 Simple Steps for Success

Register for Webinar ↗ (/en/webinar/737949/1665903)

CIOs, Optimize Your Operating Model to Align IT & the Business

Register for Webinar ↗ (/en/webinar/736641/1661612)

GenAI & Productivity: Where to Focus for Maximum Impact

Register for Webinar ↗ (/en/webinar/728749/1636108)

The 2025 Top Trends and Forces C-Suite Executives Must Consider for Strategic Planning

Register for Webinar ↗ (/en/webinar/723677/1624375)

Drive stronger performance on your mission-critical priorities.

Become a Client (/en/become-a-client?bacCtaId=bacBannerCtaBecomeaClient)

Gartner.
(/en)

About Gartner   +

Get in Touch   +

Latest Insights   +

(https://www.youtube.com/(https://twitter.com/(https://www.linkedin.com/(https://www.facebook.com/(https://www.instagram.com/gartner_inc/)

;