

Scale AI Safely With Strong Foundations

Establish foundations for AI-ready software engineering technology.



Building AI applications on top of a poor foundation leads to digital disaster

A robust software engineering foundation is essential for scaling AI responsibly and achieving tangible results. While building AI agents is exciting, it became the leading pain point for software engineering leaders in 2025. Prolonged prototyping drives up costs without delivering business value, while rushing AI into production risks significant harm to both the company and its customers.

Creating and delivering on AI strategy is a top 3 priority for **45%** software engineering leaders.

Strong software engineering foundations guarantee the safety, composability and adaptability required to scale AI. Ignoring this baseline invites catastrophic application and automation failures.

To enable the organization's AI readiness, engineering leaders must:

- Measure the architecture readiness to support your software engineering AI strategy
- Treat APIs as strategic products to drive innovation, ecosystem engagement and platform scalability
- Modernize architectures and remediate technical debt to prevent legacy systems from holding innovation stagnant

By mastering these fundamentals, leaders build the trust and operational resilience required to turn AI ambitions into reality.



Tigran Egiazarov
Vice President Analyst

Your roadmap to success

Strong software engineering foundations guarantee the safety, composability and adaptability needed to capitalize on AI opportunities. This roadmap details critical steps to prevent digital disaster and ensure teams deploy scalable AI solutions.

Gartner equips software engineering leaders with actionable frameworks and architectural guidance to build secure, AI-ready environments. With Gartner, software engineering leaders deliver scalable AI applications, reduce technical debt and drive competitive business value.

1. Select software, technologies and processes to ensure readiness for effective AI software engineering.

2. Modernize architecture, data infrastructure and APIs for scalability, interoperability and AI readiness.
3. Implement AI engineering platforms to enable and expand adoption of AI-building capabilities.
4. Establish governance frameworks for responsible AI development, standardized tools and secure operational practices.

3 key outcomes to consider in Step 1

Measure architecture readiness to guarantee infrastructure supports the AI strategy and prevents expensive application deployment failures.

Evaluate current technology stacks to confirm tool suitability for targeted AI use cases and eliminate platforms that generate technical debt.

Select optimal AI coding agents and development platforms to standardize engineering processes and accelerate the delivery of AI-enabled software.

Key questions your software engineering peers are asking Gartner

Gartner clients can click to explore answers.

Which emerging AI agent architectures, platforms and technology trends are key for software engineering?

[Explore Answer ↗](#)

Which API and data strategies differentiate high-performing organizations?

[Explore Answer ↗](#)

How is AI reshaping integration technologies and best practices?

[Explore Answer ↗](#)

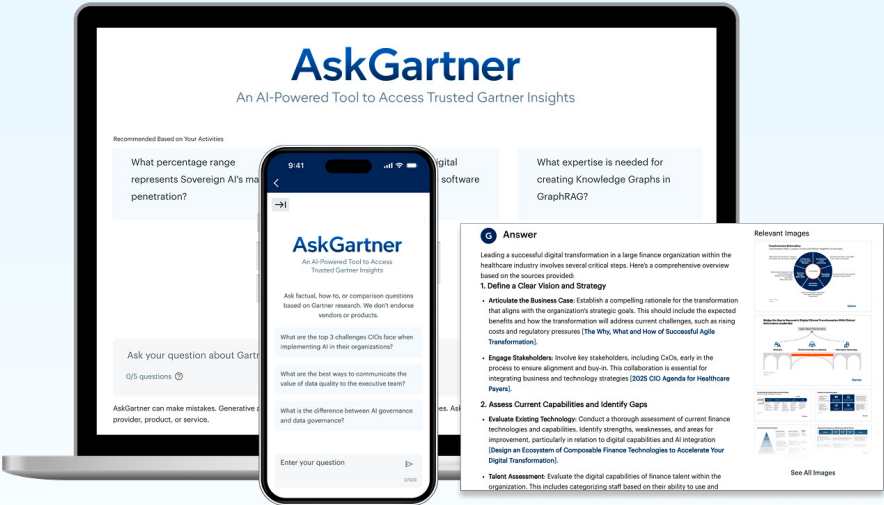
How do we modernize our application architecture to better enable AI application development?

[Explore Answer ↗](#)

What are the security and quality risks of generative AI?

[Explore Answer ↗](#)

Your peers use AskGartner to answer these questions in minutes.



Learn More

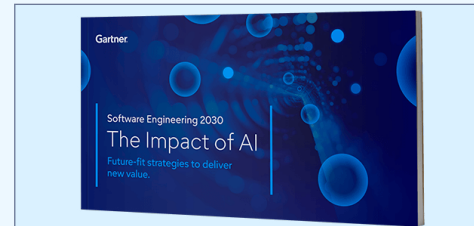
Gartner resources turn your priorities into plans and actions

Select software, technologies and processes to ensure readiness for effective AI software engineering.



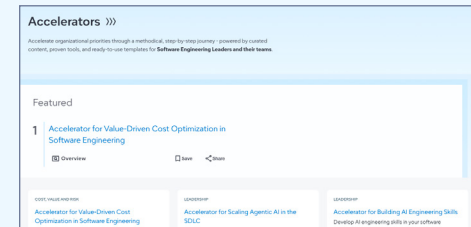
Webinar: Magic Quadrant for Enterprise AI Coding Agents: A Guided Tour

Modernize architecture, data infrastructure and APIs for scalability, interoperability and AI readiness.



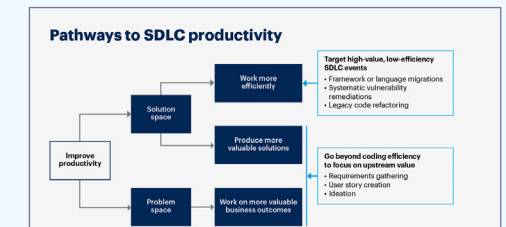
eBook: Future of Software Engineering 2030: The Impact of AI

Implement AI engineering platforms to enable and expand adoption of AI-building capabilities.



Gartner Accelerators

Establish governance frameworks for responsible AI development, standardized tools and secure operational practices.



Framework: Don't Limit AI in Software Engineering to Coding

Engage with Gartner

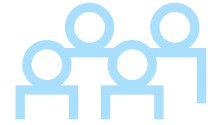
- Connect with an analyst to review your AI application development maturity to protect investments and initiatives.
- Identify and implement the right AI application development frameworks and technologies that will accelerate time to value for your organization.

Expected outcomes

- Software engineering and AI maturity models that map your as-is and to-be scenarios with plans and guidance to outline and highlight the journey
- Architecture guidance to diminish the impact of legacy systems or technical debt on AI value capture
- Best-in-class technology across AI and MCP gateways, integration and API platforms, and AI application development tools

Who needs to be involved?

The most successful organizations establish cross-functional teams to their foundations for AI-ready software engineering technology initiatives. We have outlined the recommended functions to involve and their roles to ensure the best success in hitting the milestones.



CIO/head of technology ↗

Sets a clear enterprisewide AI ambition, identifies use cases, quantifies benefits and risks, aligns teams and competencies, and drives innovation across the organization.

Software engineering leader and team ↗

Drive AI integration by clarifying desired outcomes, establishing engineering best practices, transforming services with an AI-first approach and architecting software development to support AI objectives.

Head of AI ↗

Develops, champions and executes the organization's AI strategy by overseeing AI use case selection and scaling, establishing governance and literacy, implementing solutions, monitoring market trends, building a world-class team and reporting on business impact.

Chief data and analytics officer and team ↗

Lead the organization's AI-ready data strategy by identifying use cases, establishing governance, developing new data value and ensuring data readiness for AI technologies.

Chief information security officer and team ↗

Integrate cybersecurity and data privacy into AI strategy by managing trust, risk, sovereignty and security; overseeing programs; anticipating threats; updating skills; and designing resilient solutions.

Head of enterprise architecture and team ↗

Align AI structure and design with organizational value by guiding use cases and requirements, governing architecture investments, leading adoption decisions and architecting AI solutions.

Use Case

Establish Foundations for AI-Ready Software Engineering

Mission-critical priority

As organizations look to capitalize on AI, software engineering teams must move beyond the hype and focus on building strong foundational capabilities. Establishing AI-ready software engineering practices is critical to protecting investments, reducing risk and enabling sustainable value creation.

**How Gartner resources help**

Software engineering leaders work with Gartner to establish the foundations for AI-ready software engineering, enabling scalable and secure AI application development. Gartner helps leaders assess current capabilities and define a clear path forward through maturity models that map as-is and to-be states with actionable guidance.

Leaders leverage Gartner Magic Quadrants, Accelerators, insights, toolkits and frameworks to modernize architecture, data and APIs; implement AI engineering platforms; and select the right technologies to support AI at scale.

**Mission accomplished**

With support from Gartner, organizations build the core engineering foundations required for AI-ready software development. They improve architectural readiness by reducing the impact of legacy systems and technical debt, strengthen integration maturity and adopt best-in-class technologies across AI, MCP gateways, integration and API platforms, and AI application development tools.

As a result, organizations reduce risk, protect critical investments and enable scalable, secure and consistent AI delivery.



Address your other mission-critical priorities



Build and integrate AI applications and agents.

Creating and delivering on their AI strategy is the **No. 1 priority** for software engineering leaders.



Use AI to accelerate productivity throughout the software development life cycle.

80% of software engineering teams will struggle to see productivity gains from using AI, unless they apply it across the full SDLC.



Future of software engineering: Reenvision organization, teams, talent and workflows.

68% of software engineering organizations say AI-driven automation will cause all engineering roles to evolve.



Establish foundations for AI-ready software engineering technology.

60% of software engineering leaders expect to increase investments in AI-augmented tools, AI capabilities and AI skills.



Innovate and modernize to improve software engineering value delivery and costs.

Only **50%** of software engineering leaders rate their teams highly effective in meeting target business objectives.

Connect with us

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