Gartner

Use AI to Accelerate Productivity Throughout the SDLC

Reimagined software development in the AI era

Software engineering is at an AI-led inflection point

The time for AI experimentation is over. Organizations need to see measurable performance and business impact from AI in the software development life cycle (SDLC). As leaders move from piloting new technologies to architecting value, the challenge is no longer about recognizing AI's potential, but about delivering outcomes that matter.

60% of organizations report a decrease in time spent on engineering tasks and code review time using AI tools in the SDLC.

Software engineers and organizations that do not adopt AI tools throughout the SDLC will not just fall behind — they will suffer significant productivity and value delivery losses.

The Gartner position is clear:

- → Software engineering teams will struggle to see productivity gains from using AI unless they apply it across the full SDLC.
- → Teams must apply AI to high-value use cases and govern growth to increase production while minimizing technical debt.
- → AI will require more software engineers, not fewer. Use AI productivity gains to increase talent, especially in AI engineering skills.

This eBook will help software engineering leaders build a focused, step-by-step approach to applying AI across the SDLC — linking strategic priorities to practical, measurable outcomes.

Dr. Keith D. Holloway
Senior Director Analyst

Your roadmap to success

Software engineering leaders face mounting pressure to deliver measurable outcomes from AI investments. The path forward requires more than isolated pilots — it demands a disciplined approach that connects AI strategy, skills and technology to business value.

Gartner guides leaders through each step, from defining the right metrics and building critical capabilities to selecting high-impact use cases, ensuring that every AI initiative drives productivity, quality and organizational performance.

1. **Define your AI software engineering strategy.**
2. Roll out AI coding assistants and agents.
3. Expand the use of AI agents across the full SDLC.
4. Measure and improve the ROI of using AI tools across the SDLC.
5. Scale and optimize agentic AI tools across the organization.

3 key outcomes to consider in Step 1

Define key metrics for measuring AI impact in the SDLC. Establish clear metrics for productivity, quality and speed to quantify AI's effect on engineering outcomes and ensure ongoing business value.

Identify the skills required to effectively use AI in software development. Pinpoint and develop critical AI, platform engineering and DevOps skills to empower teams to adopt, scale and optimize AI tools across the SDLC.

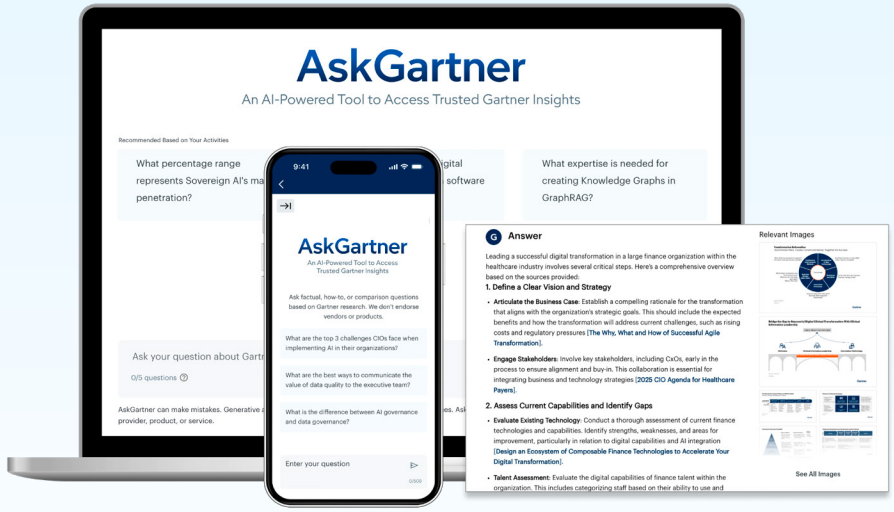
Select top AI use cases and technologies that can improve those metrics. Prioritize AI use cases — such as code generation, review and testing — and choose technologies that directly advance your most important engineering metrics.

Key questions your software engineering peers are asking Gartner

Gartner clients can click to explore answers

Which are the most important use cases for agentic coding throughout the SDLC?	Explore Answer ↗
What foundational technologies are necessary for successful AI adoption?	Explore Answer ↗
How do we demonstrate and deliver the true business value of AI in software engineering?	Explore Answer ↗
How do we begin, mature and then scale the use of AI in our SDLC?	Explore Answer ↗
How and when should we leverage AI for code modernization?	Explore Answer ↗

Get fast, expert-backed answers with AskGartner.



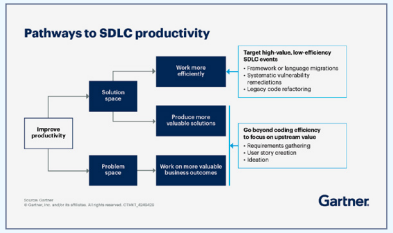
Learn More

Gartner resources turn your priorities into plans and actions

Always be two steps ahead.

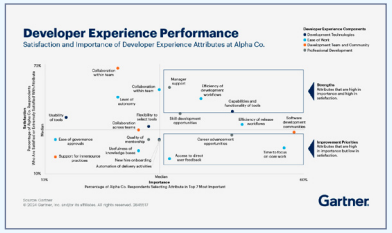
Insights: Software Engineering 2030: The Impact of AI ↗

Apply AI across the SDLC to unlock full value.



Article: Don't Limit AI in Software Engineering to Coding ↗

Optimize your developer experience.



Tool: The Gartner Developer Experience Assessment ↗

Discover a coordinated approach to lead with AI.

Insights: How Software and D&A Leaders Can Drive AI Innovation ↗

Strengthen the effectiveness of AI-generated tests.

Webinar: Use AI Mutation Testing to Improve Software Quality ↗

Engage with Gartner

- Connect with an analyst to identify, review and refine your AI strategy and AI tools for the SDLC.
- Get guidance from analysts and an Executive Partner on change management best practices throughout your AI adoption journey, including how to best overcome roadblocks such as low adoption, expensive tooling and developer resistance.

Expected outcomes

- Framework to analyze top use cases for AI in SDLC
- Agentic coding tools rollout aligned to enterprise strategy
- Business case for AI tooling to get the budget approved

Who needs to be involved?

The most successful organizations establish cross-functional teams for their accelerating AI with SDLC 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 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.

Chief data and analytics officer and team ↗

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

Use Case

Driving SDLC Transformation and Productivity Through AI With Gartner

Mission-critical priority

Software engineering leaders are accelerating AI integration while aligning teams around more coordinated, scalable strategies. This shift marks a move from early experimentation to intentional adoption models that drive productivity across the SDLC. There is clear alignment that AI is no longer limited to coding assistance but is expanding into agentic applications that support the entire SDLC and enable broader business automation.

How Gartner resources help

Leaders partner with Gartner to embed AI across all phases of the SDLC — from requirements and design to coding, testing and operations — to transform productivity through AI. Tailored insights, proven frameworks, AI maturity models, consultations with Gartner analysts and opportunities to connect with peers help leaders quickly identify high-impact AI opportunities and avoid common adoption pitfalls. A Gartner partnership goes from strategy through implementation guidance that enables clients to accelerate execution and targeted outcomes.

Mission accomplished

Clients move from fragmented use cases and pilots to scaled, strategic AI adoption across the SDLC, ultimately transforming how software is built and delivered. Clients achieve faster time to value from AI investments by prioritizing the right AI use cases within the SDLC and implementing them seamlessly into existing development workflows. Organizations gain improved developer productivity, higher code quality and reduced life cycle times.

Address your other mission-critical priorities

Use AI to accelerate productivity throughout the SDLC

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

Build and integrate AI applications and agents

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

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.

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.

Connect with us

Get actionable, objective business and technology insights that drive smarter decisions and stronger performance on your mission-critical priorities.

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