Everything you *wished for?*

Has Gen AI for software
engineering lived up to the hype?

Capgemini

When Gen AI first caught the eye of software developers, the predictions were wild.
Now – a couple of years out – we can start to parse fact from fantasy.
Our recent survey details the way **Gen AI is actually being used in software** today, and the profound implications across all sectors.

On November 30th, 2022, Open AI opened the floodgates. By January, 100 million users were using their new Chat GPT app, making it the fastest growing user base of all time. In our line of work supporting business leaders across industries, the mix of excitement and caution, fascination and dread, and intense curiosity – it's like nothing we've seen.

Around the world and across industries – from healthcare and finance to manufacturing and entertainment – we've enjoyed discussing potential futures with our clients. Among the many questions that we've heard:

- How will generative AI change the way our software engineers work?

- Will Gen AI solve the scarcity of software development talent? … and will it impact my role?

- How exactly might Gen AI improve collaboration between business and technology teams?

- Will Gen AI affect coding quality, for better or for worse?

- What are the challenges for software engineering and how best can we manage the risks associated with generative AI?

- How can we go from one-off, small-scale use cases to truly transformative use of Gen AI?

To find answers, The Capgemini Research Institute recently interviewed 1,000 senior executives and 1,000 software professionals from organizations with over $1 billion in annual revenue. The results are a snapshot in time of these early, excited stages of Gen AI adoption.

"A tool like GitHub Copilot is so impactful because suddenly engineers can make changes to other developers' code with little previous exposure."

Severin Hacker,
Duolingo Chief Technology Officer

The time-saving potential of Gen AI

There were a great many predictions in regard to the time savings to be made from Gen AI, with some even suggesting up to 50% faster code development. In reality, it is less. Our published report finds that organizations using generative AI have seen a 7 – 18% productivity improvement in the software engineering function. This is highest for specialized tasks such as coding assistance (with 34% as the maximum potential for time savings, and 9% on average) and creating literature and documentation (ranging from a maximum of 35% to an average of 10%).

Therefore, it comes as no surprise that coding assistance is the most widely recognized use case. And while time savings is a key area of focus, it's also important to consider the quality and collaboration improvements that are emerging alongside these initial gains.

With the help of Gen AI, software engineers are producing higher-quality code with fewer errors and improvements in test coverage and quality. Both factors give organizations a productivity boost at team and organizational levels.

But productivity is not the only benefit. Across the board, organizations are reaping benefits from Gen AI within software engineering – with augmenting innovation being the leading benefit. (When we say innovative work we include – for example – developing new features and services using software). Across sectors, 61% of software engineers cite enablement of innovative work as a top benefit, with telecom and retail at the forefront.
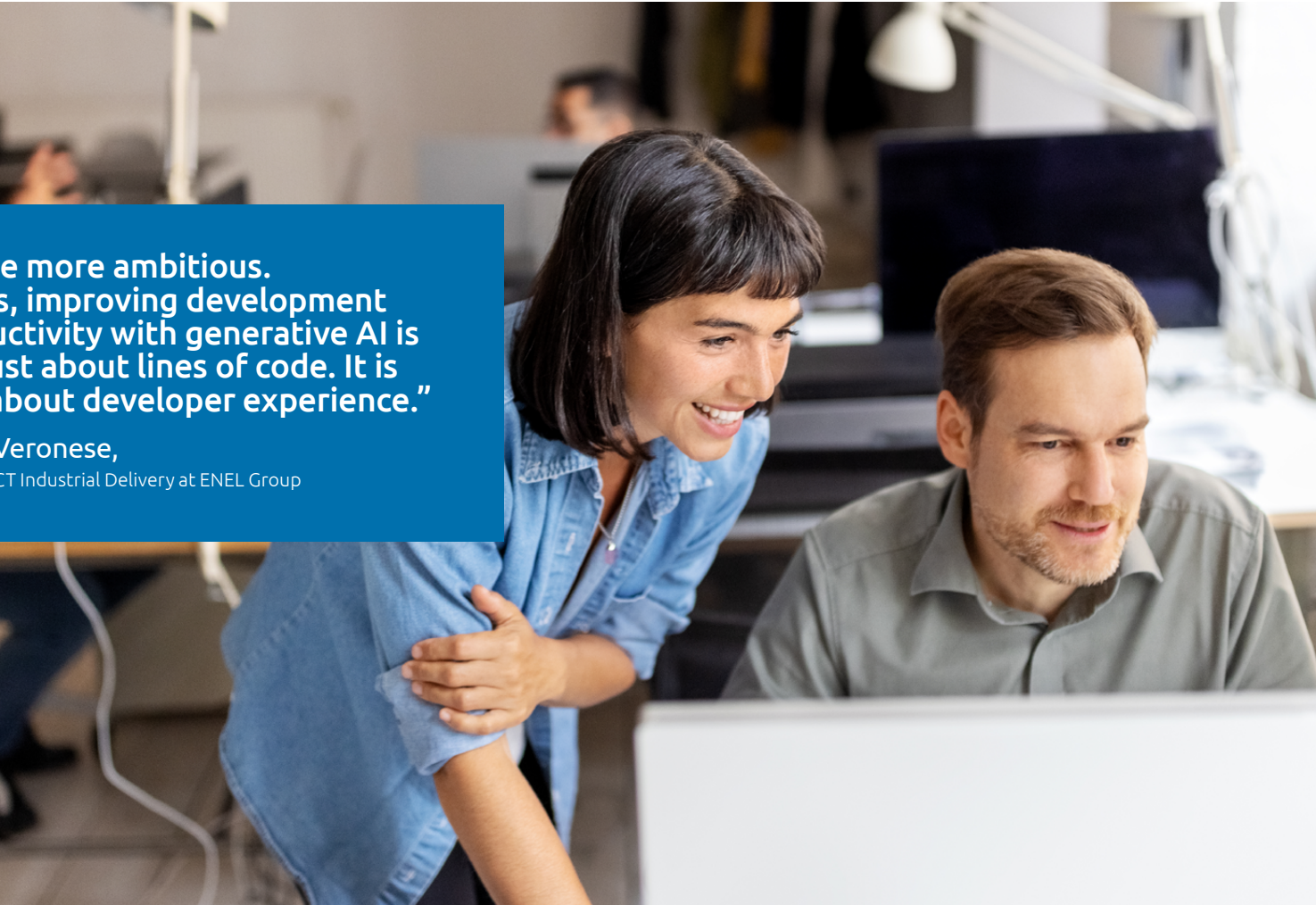
A partner, not a replacement

So, if the average software development task can be finished 7 – 18% faster, does that mean companies are laying off 7 – 18% of their workforces? We're happy to report that no: just 4% of organizations plan to use Gen AI to reduce their headcount. (In fact, this was the lowest response to any question in the entire survey.)

What generative AI is doing is precisely what many optimists dared hope for – it's helping to close the talent gap. At a time when many organizations are forced to choose which projects are given all the resources they need, and which will have to make do with less, Gen AI's shrinking of the talent gap is very good news. AI is helping them optimize their workflows by automating repetitive tasks, allowing them to focus on higher-value work and drive greater satisfaction within their roles.

One of the key findings of this report is that, far from being replaced by Gen AI, developers are doing the replacing: they're taking the initiative to outsource parts of their own work to Gen AI, thus creating time to focus on the tasks they want.

This helps explain why 69% of senior software professionals report high levels of satisfaction from using generative AI for software development. Gen AI excels at painstaking tasks. Earlier we looked at which tasks are most prone to time saving. Number one on that list was creating documentation – a task with little room for creativity. Some developers are now using Gen AI to help track changing requirements and validate requirements documentation by analyzing it for completeness and clarity.

"We are more ambitious.
For us, improving development productivity with generative AI is not just about lines of code. It is also about developer experience."

Fabio Veronese,
Head of ICT Industrial Delivery at ENEL Group

Generative AI bridges the gaps between teams

One of the top benefits of Gen AI in software development came a bit out of the blue: 78% of software professionals expect generative AI to improve collaboration between business and technology teams. How exactly might it do that?

We talked with Lech Dulian, a web development lead at Capgemini, to get his perspective.

"Anytime you need to share information between technical teams and non-technical teams, there will be challenges." Lech explained. "For a lot of coders, the most difficult part of their job are the emails where they need to explain their work. Now an LLM [Large Language Model – a subset of Gen AI] does that for them. And it's polite, and follows all the social protocols that, for some of them, they'd rather not have to think about. They're happiest when they're writing code."

He gave the example of an update to an app. "By the time a release is ready, it can be hard to draw a straight line between the initial requests – the patches, the user stories, etc. – and the release. That's normal, but it can be hard to put into words. None of that is an issue anymore. The LLM does all of that."

Grammarly, known for their AI-enhanced writing software, estimated losses of **$1.2 trillion due to miscommunication** within organizations. On a more qualitative level, miscommunication is also a source of immense frustration. Consider a software developer who puts in extra hours, only to learn that his contribution is not what his manager needs – that's going to take a toll on morale. The ability of Gen AI to intermediate between technical and non-technical teams is one of the most positive findings from our research.

> "Generative AI can promote collaboration and cross-functional thinking amongst software engineers. AI can help them understand how their solution."
>
> Avanthika Ramesh,
> Director of Product Management at Salesforce

The risk of generative AI in software development

Now for the negative, and one of the most important discoveries in our research: a stunning 63% of software professionals are using generative AI tools not officially authorized and supported by their organization.

These results point to a level of risk that cannot be ignored. Unknown and unauthorized use of Gen AI tools could bring serious legal, functional, and security consequences. Fortunately, there's a solution – one with far-reaching benefits.
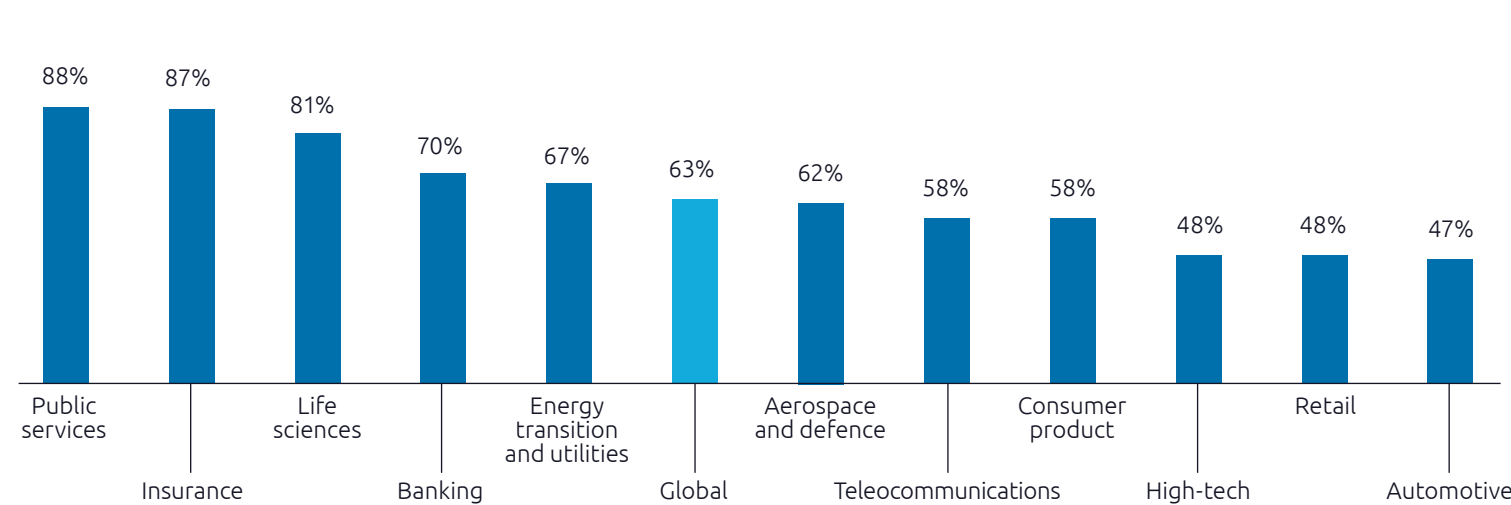
Establishing a Gen AI framework

A Gen AI governance framework defines standards and guidelines to align generative AI use with company objectives. In 61% of the companies we surveyed, this framework is lacking. With an effective Gen AI framework in place, employees have no reason to seek out unauthorized tools – they're already getting advanced tools, optimized for their tasks, from their employer.

A Gen AI framework also establishes goals and guidelines for knowledge sharing and upskilling, and plays a crucial role in scaling your solutions. In a field so energized with energy and ideas, this provides the structure.

Percentage of workforce using unoffical and unsupported generative Al solutions and tools, by industry

| Industry	%
Public services	88%
Insurance	87%
Life sciences	81%
Banking	70%
Energy transition and utilities	67%
Global	63%
Aerospace and defence	62%
Teleocommunications	58%
Consumer product	58%
High-tech	48%
Retail	48%
Automotive	47%

Measuring success

Generative AI is transforming software design, coding, and testing, boosting productivity by generating outputs like UI mockups and entity models. However, to fully realize its benefits, measurement is essential. In a data-driven world, a measurement framework helps turn raw data into actionable insights, ensuring Gen AI meets goals like efficiency, accuracy, and cost reduction. It also identifies areas for improvement, tracks progress, and demonstrates ROI, enabling better decision-making.

Some considerations will vary by sector, but the fundamentals remain the same: effective measurement requires a holistic approach that considers qualitative and quantitative factors. Together, a Gen AI framework and a system of measurement transform small-scale, haphazard improvements into a reliable engine of efficiency.
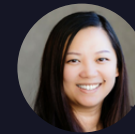
Read more of our research here.

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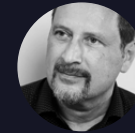
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About Capgemini

Capgemini is a global business and technology transformation partner, helping organizations to accelerate their dual transition to a digital and sustainable world, while creating tangible impact for enterprises and society. It is a responsible and diverse group of 340,000 team members in more than 50 countries. With its strong over 55-year heritage, Capgemini is trusted by its clients to unlock the value of technology to address the entire breadth of their business needs. It delivers end-to-end services and solutions leveraging strengths from strategy and design to engineering, all fueled by its market leading capabilities in AI, cloud and data, combined with its deep industry expertise and partner ecosystem. The Group reported 2023 global revenues of €22.5 billion.

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