CIKLUM

How to unlock R&D potential with AI-augmented tools

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Introduction

Over the past couple of years, the landscape for start-ups, scale-ups and high-tech investments has fundamentally changed.

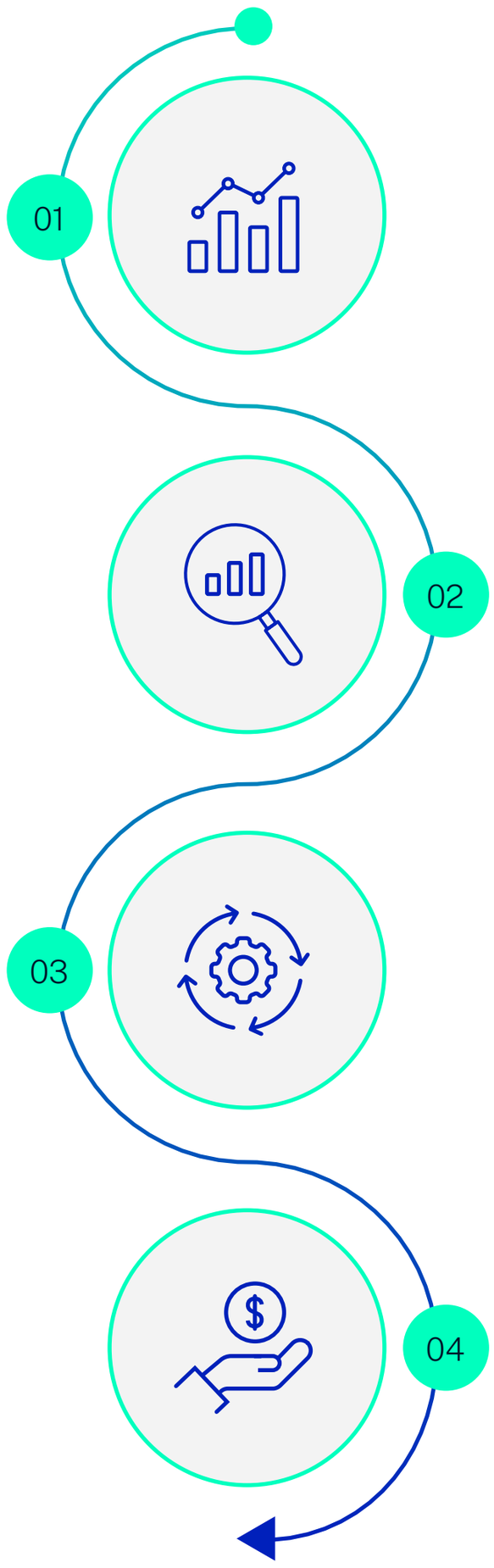
Investors have become more cautious and placed more of a focus on profitability, which has made it more difficult for ambitious entrepreneurs to get the investment they need to grow. Those who have been unable to get that investment have either had to pause their growth plans, or in some cases reduce their headcount.

However, that doesn’t mean that taking a start-up to the next level is impossible. In a climate where it’s becoming essential to do more with less, and stretch investment and funding over a longer period of time, there are many ways to innovate and discover efficiencies.

01 Challenges on multiple fronts

The pressures to grow businesses and take concepts to the next level are multiple, and there are often several common financial factors at play. These include, and are not necessarily limited to:

Development and expansion
All start-ups and high-tech companies need sufficient resources to establish their market presence and widen their customer base. If they don't have these in place internally, then they may need to attract external investment or expertise to get there



Market volatility
In turbulent financial times, it's harder than ever to predict market fluctuations and what that might mean for scaling businesses. It's therefore vital to gain as much financial flexibility as possible to navigate through whatever circumstances arise

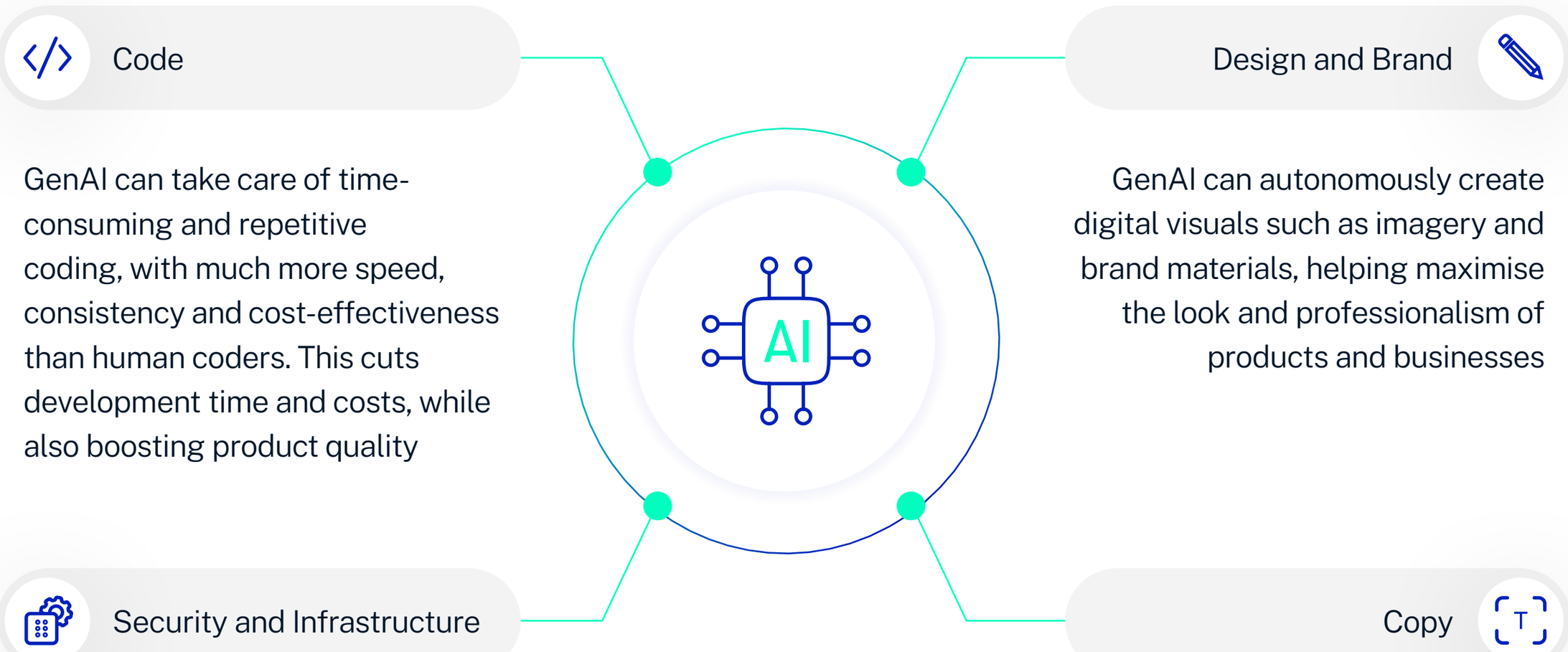
Ability to scale
Upscaling operations often demands substantial extra capital, especially to do so at a pace that aligns with market demand and revenue growth expectations. Having this financial capability in place reduces the risk of premature scaling that can put undue pressure on available resources

Investment in R&D and product
Without adequate resources, businesses can't innovate and develop their products, or launch new features, which hampers their potential and competitiveness

02 AI-augmented tools as a solution to do more with less

Strong competition, financial pressures, the need for first-mover advantage and a challenging economic climate mean high-tech ventures have to be agile and efficient. And in businesses where resources are limited, either in financial or in human terms, technology can help ambitious firms maximise their potential with what they have.

Generative AI can be used not only to accelerate R&D efforts, but also to boost revenue streams. The ways in which GenAI can be deployed are multiple:



Code generation deep dive:

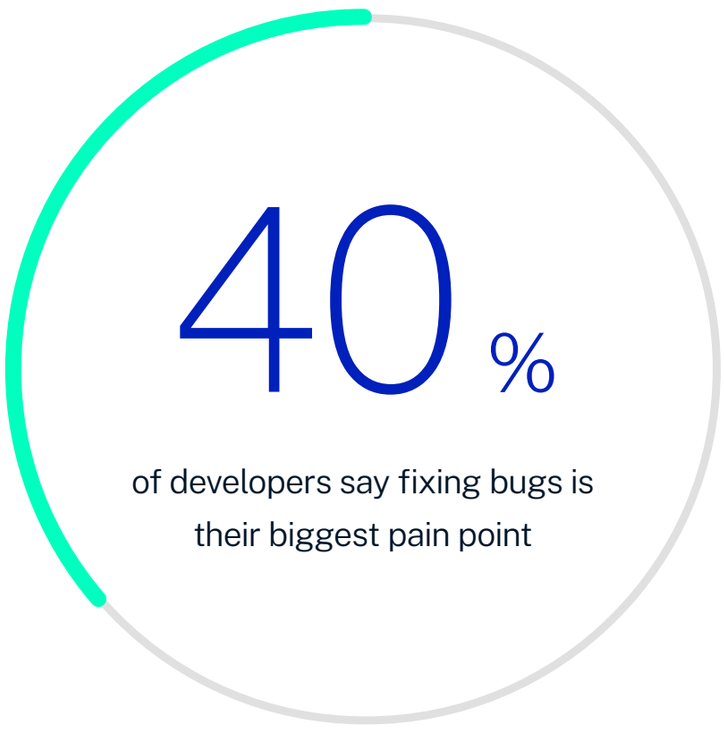
how software development got more complex

As the importance of software development has increased in every type of business, the scale and complexity of development has naturally become more complicated. Now more than ever, businesses are being expected to develop more, develop better and develop faster, especially in a highly competitive and globalized world where first impressions and first-mover advantage often count for a lot.

One of the biggest drivers of increased complexity is the growth of cloud-native applications, and cloud computing more widely. It wasn't so long ago that applications were simply built on servers in their own architecture, but times have changed: now development regularly involves microservices, container packaging, orchestration, and hosting in distributed cloud. Add in the rising expectations of consumers and end-users, as well as the growing threat of cybercrime, and it's becoming harder and harder for development teams to tick all the boxes that they need to tick.

Often, something has to give, and developers end up cutting corners and end up building technical debt into an application, even if they don't necessarily mean to. Rushed design and architecting, limited testing and messy code are all typical systems, and cause more harm than good in the long run. According to CIO Dive, 40% of developers say fixing bugs is their biggest pain point, and that it takes up a quarter of their working time.

When these cut corners arise, customers can tell: CIO Dive also found that 88% of bugs are found by customers first, while Forbes reports that more than a third of smartphone users will delete an app if they find a bug or glitch in it. And the impact of all this on the bottom line is stark.
The Consortium for Information & Software Quality has found that in 2020 alone, the global cost of poor software quality was more than $2billion.



The most obvious solution to handling this increased complexity would be to expand the developer skills base within the organization. But good-quality developers are in short supply, and therefore can be extremely expensive to acquire, to a point that they are beyond the reach of many businesses. It's for this reason more than any others that technology is coming in to fill the void.

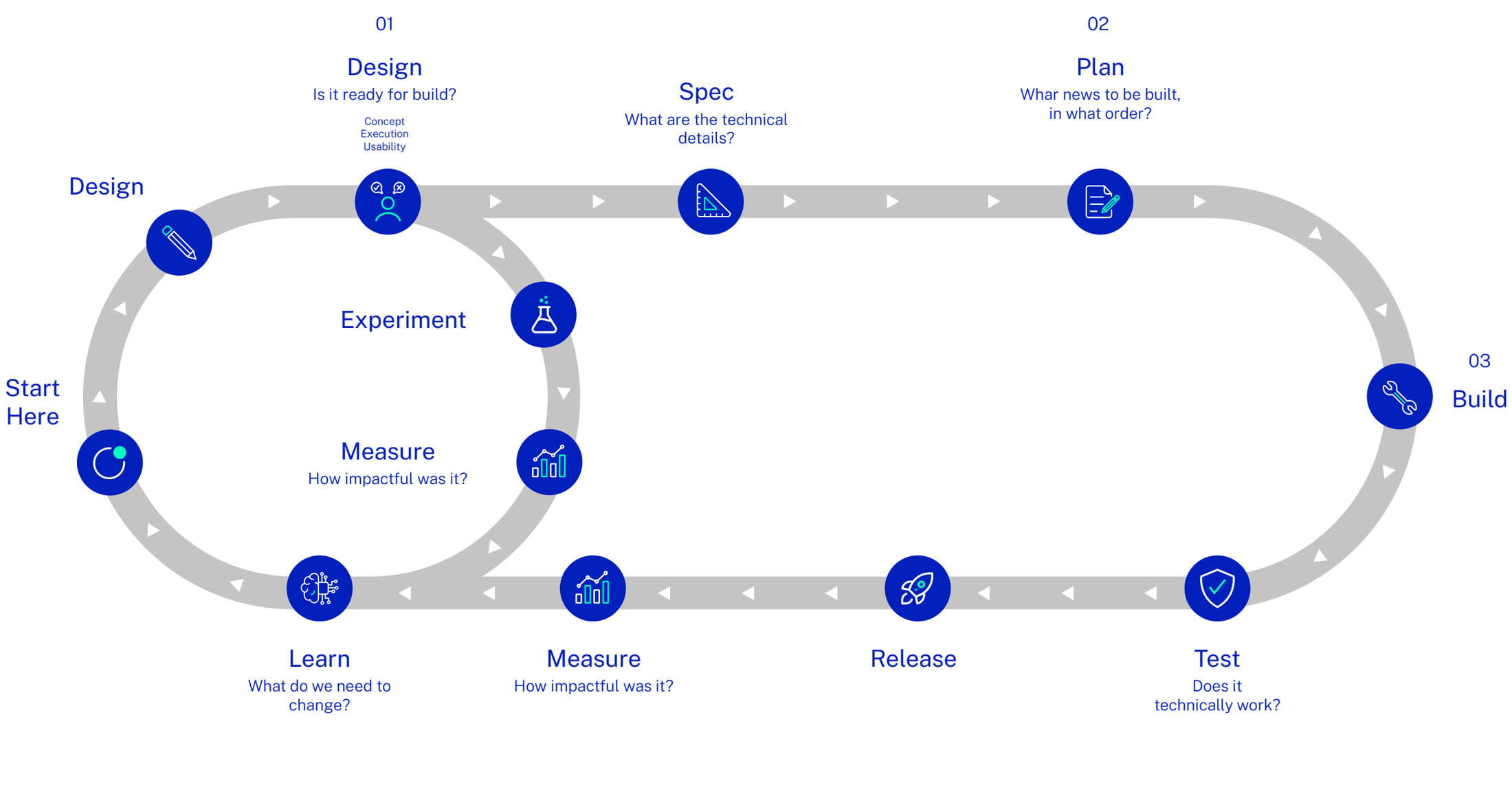
Why conventional software development isn’t working any more

Despite all the changes that have occurred in technology in recent years and decades, general approaches to software development haven’t kept up. McKinsey research suggests that over the last 20 years, software development productivity has stagnated, even as tools and methodologies have advanced. At the same time, a report by the Software Improvement Group suggests that code complexity, duplication and maintainability have contributed to a decline in software systems’ technical quality over the last decade.

When development challenges arise, many of the conventional methods of solving those challenges are still very people-focused. Manual coding practices, peer code reviews, and the use of standard Integrated Development Environments (IDEs) with basic autocomplete and syntax highlighting features are still commonplace. Similarly, developers still rely on documentation, online forums and code repositories to find solutions to problems, learn new technologies or debug any issues.

However, this approach was and is very inefficient. It’s extremely time-consuming, very difficult to scale as project size and complexity increases, and is also highly prone to human errors - especially if overworked developers become fatigued. This also soaks up valuable employee time that could be used on high-level design, or to help speed up and innovate development processes, which further impacts the efficiency and capability of the solutions being developed.

Gradually, the more linear approaches to development like Waterfall, are being replaced by more agile methodologies like Scrum, which place a greater emphasis on flexibility, closer collaboration and a more iterative attitude to development. However, development approaches have been left so far behind, and software has become so complex to create, that this change of tack cannot solve the problem on its own.



Why AI support is the way forward for software development

Artificial intelligence is proving to be this decade's leading solution to dealing with complex software development without compromising quality or efficiency. According to Gartner, the proportion of professional developers that will be using AI-powered coding tools will reach 70% by 2027. Furthermore, Stack Overflow has found that 55% of people that are currently learning to code are using AI tools, which will drive further AI adoption as the next generation of developers enter the global workplace.

Leading AI-augmented tools like GitHub Copilot and Tabnine assist developers by suggesting entire lines and even blocks of code, based on the context of the work that developers are doing. It does so by leveraging vast databases of open-source code, and suggesting relevant recommendations. In essence, the AI tool is a 'pair programmer', massively expanding the skills, capability and productivity of the developer.

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The same principle is also being applied to several other important areas of the software development process, including:

Automating and speeding up tasks that are simple and repetitive, like boilerplate code creation, to further free up developer time and reduce the risk of human error

Assist with debugging and testing processes, to increase productivity and speed up development sprints

Generating unit tests and utilizing the GPT chat for code explanations where logic is quite complex

Upskill developer knowledge by introducing them to new ideas and principles ‘on-the-job’, helping businesses expand their skill base quickly for a small outlay compared to recruiting extra developers

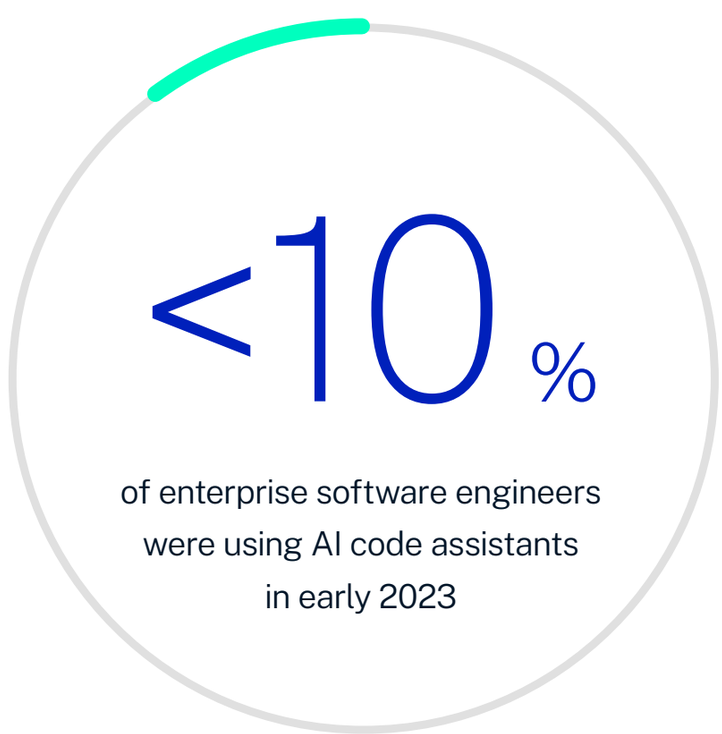
Ensure consistency in naming conventions and code structures, both for individual developers and to improve readability and maintainability

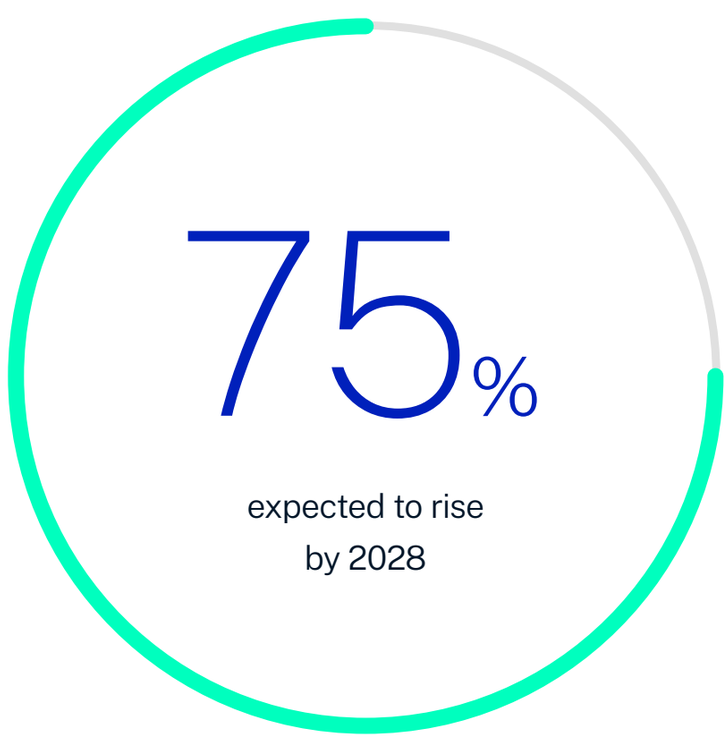
All this means that code cycles are shorter, code reviews are faster, change and fix iterations are quicker, and innovation is easier and more scalable. From a business perspective, this means software with greater capabilities and fewer errors delivering better customer experiences, and getting to market faster. And all this can be achieved without having to rely on scarce and expensive IT talent that can be difficult to retain in the long-term.

There’s no time to lose in AI adoption

AI is proving to be a game changer in time-to-market, handling the most complex of development projects, embracing scalability, and delivering maximum return on investment.

And the value that AI tools for software development is providing to businesses means that adoption is accelerating at a rapid rate. According to Gartner, less than 10% of enterprise software engineers were using AI code assistants as of early 2023 - but this is expected to rise to 75% by 2028.





If you aren’t already using AI to address the problems of complexity, inefficiency and the need for innovation, you can be sure that at least some of your competitors will be - so now is the time to take action and start on your AI-assisted development journey. Remember to start small, define your use cases and have a complete change management process in place.

The urgency is especially pressing because integrating more AI into your development processes won’t simply happen overnight. You will need to select and deploy the right tools, and ensure they fit in with your existing workflows (or create new ones if they don’t). Furthermore, for many experienced developers, leveraging the help of AI tools will represent perhaps the biggest change to their day-to-day working practices that they’ve ever had to deal with. Getting their buy-in for the change, and helping them understand the right ways to use the tools to the best of their ability, is an essential part of the transformation.

As a result, the move towards AI-assisted development requires careful planning and specialist AI expertise, which most organizations are unlikely to have in-house. That's why it's so important to work with an expert partner with a proven track record in AI innovation and supporting more innovative and agile methods of software development. With their experience, you can be sure that the transformation is smooth, that the right tools help the right people in the right places, and that you can stay at the forefront of the AI innovation race in your marketplace.

Working with a global Experience Engineering firm like Ciklum gives you the best possible chance to maximize the potential of AI for code generation.

Our combination of AI-augmented tools and next-generation product engineering can help you revolutionize the solutions and experiences you create, and therefore reimagine, reshape, and redefine the future.

Contact us