GitLab

What's next in DevSecOps

Report

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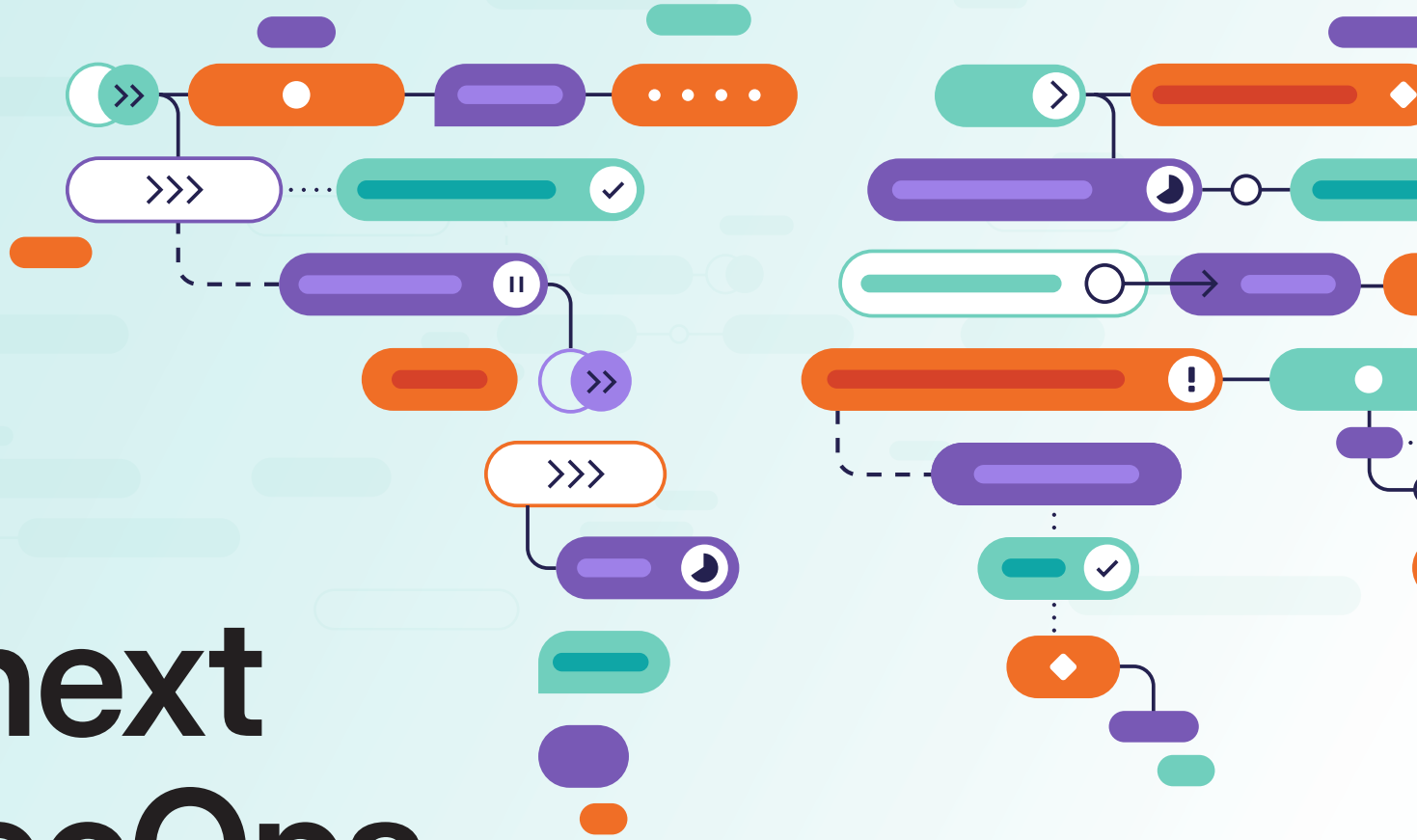

2024 Global DevSecOps Report

What's next in DevSecOps

This year's survey highlights evolving attitudes towards security, AI, and developer experience

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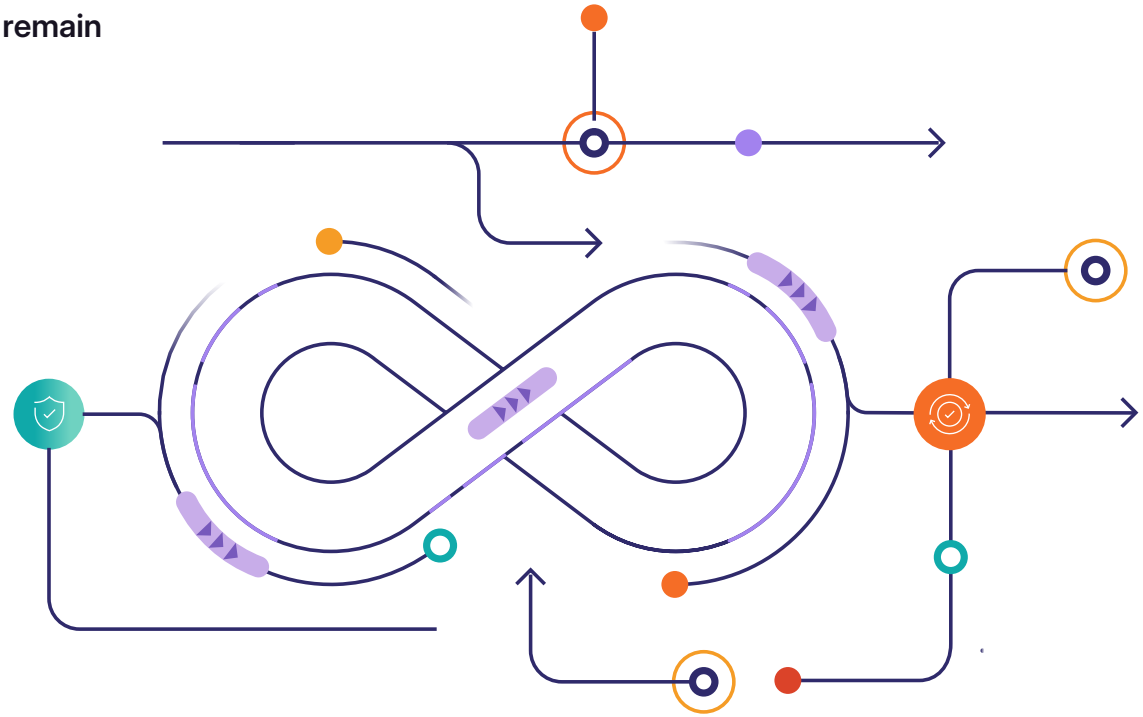


Executive summary

Our survey of more than 5,000 DevSecOps professionals worldwide showed that organizations are prioritizing investments in security, AI, and automation — and all of these are having positive effects on the experiences of developers and software engineering teams. However, this year's survey also highlighted specific areas, such as software supply chain security, that warrant particular attention as organizations build out their DevSecOps strategies.

AI is a core part of software development

78%

of respondents said they are currently using AI in software development or plan to in the next 2 years, up from 64% in 2023

Organizations are serious about automation

67%

of respondents said their software development lifecycle is mostly or completely automated

The toolchain struggle is real

64%

of respondents said they want to consolidate their toolchain

Software supply chain security is key

67%

of developers said a quarter or more of the code they work on is from open source libraries — but only 21% of organizations are currently using a software bill of materials (SBOM) to document the ingredients that make up their software components

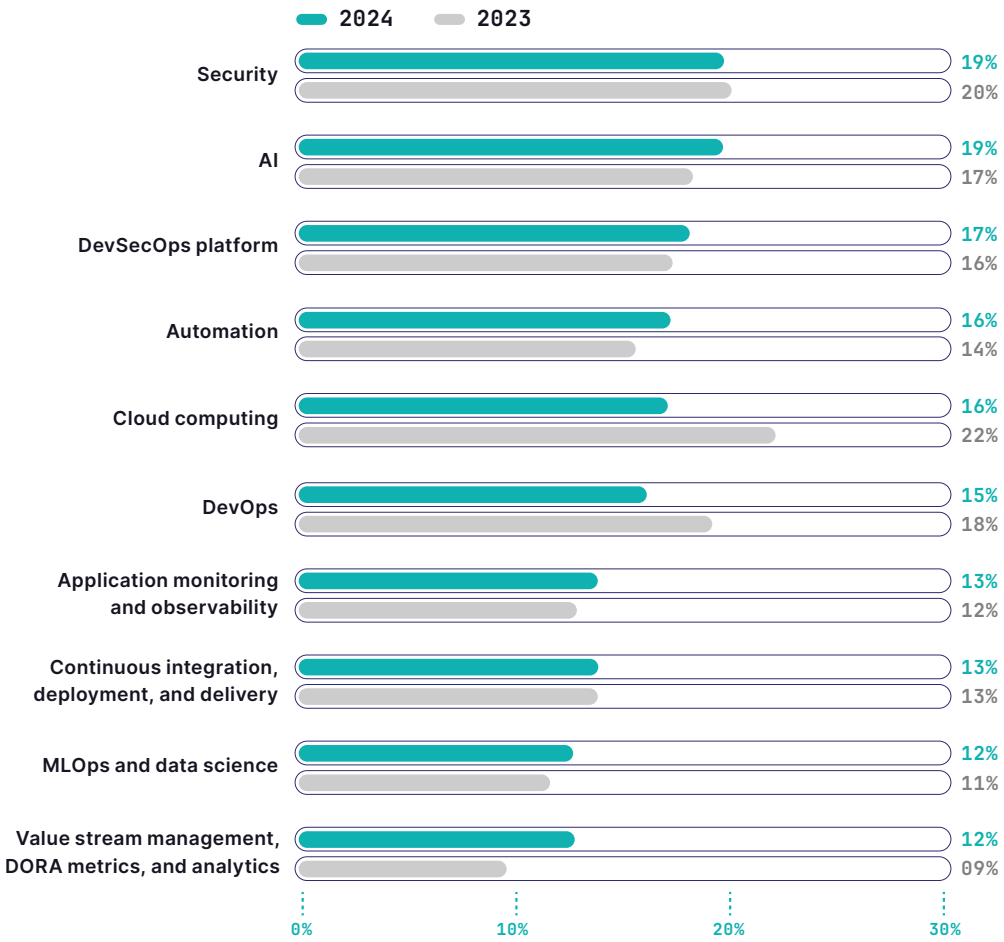
Top IT investment priorities in 2024

1. Security
2. AI
3. DevSecOps platform
4. Automation
5. Cloud computing

Security, AI, and automation: Top investment areas in 2024

This year, we noted a reshuffling of priorities as organizations continue to balance long-term, traditional priorities such as security and the cloud with other technologies such as AI and automation.

Top IT investment priorities, 2023-2024



Security remains a top priority, taking the number one spot this year despite a slight decrease in the percentage of respondents who identified security as a priority. AI showed a slight but statistically significant increase from 2023 — suggesting that AI is increasingly becoming a primary focus for many organizations.

The number of respondents who identified a DevSecOps platform as an investment priority and the number of respondents who said their organizations are currently using a DevSecOps platform this year were similar to 2023, suggesting that interest and investment in DevSecOps platforms remains stable. Meanwhile, interest in automation saw a significant increase in 2024, with automation jumping from priority number six in 2023 to number four this year.

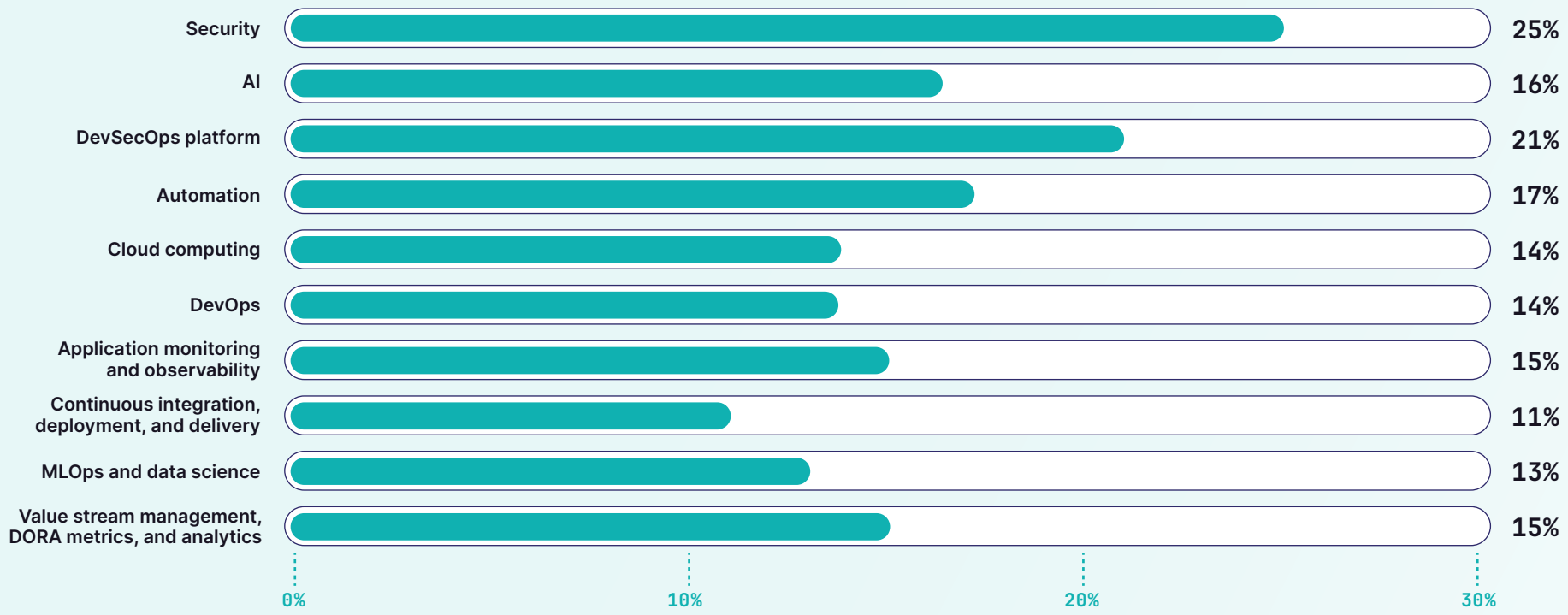
One of the biggest signals of the reshuffling of priorities is the fate of cloud computing: The cloud was the top priority in 2023, but this year it dropped to number five. However, it's clear that the cloud continues to be important — we saw a significant decrease year over year in the number of respondents who said they are running less than half of their apps in the cloud (68% in 2023 to 43% in 2024), and a corresponding increase in the number of respondents who said they are running 50% or more of their apps in the cloud (32% in 2023 to 55% in 2024). This suggests that while the cloud is still mission-critical for many businesses, it's now "table stakes" — and at the same time, the list of priorities for technical teams and IT leaders continues to grow.

Finally, while metrics and analytics didn't make the top five investment priorities this year, we did observe a significant uptick compared to last year (9% in 2023 to 12% in 2024), suggesting that this is an up-and-coming priority for organizations.

Global trends

Top IT investment priorities

Australia | Canada | France | Germany | India | Japan | New Zealand | United Kingdom | United States



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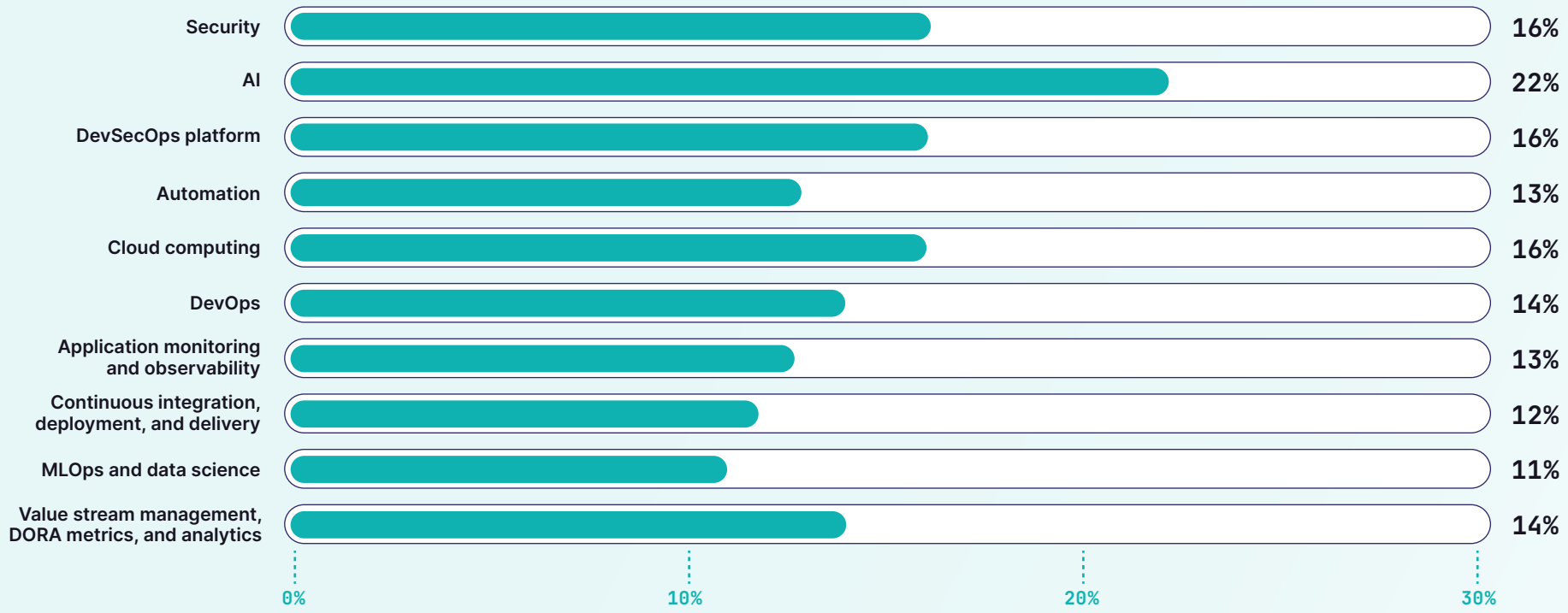

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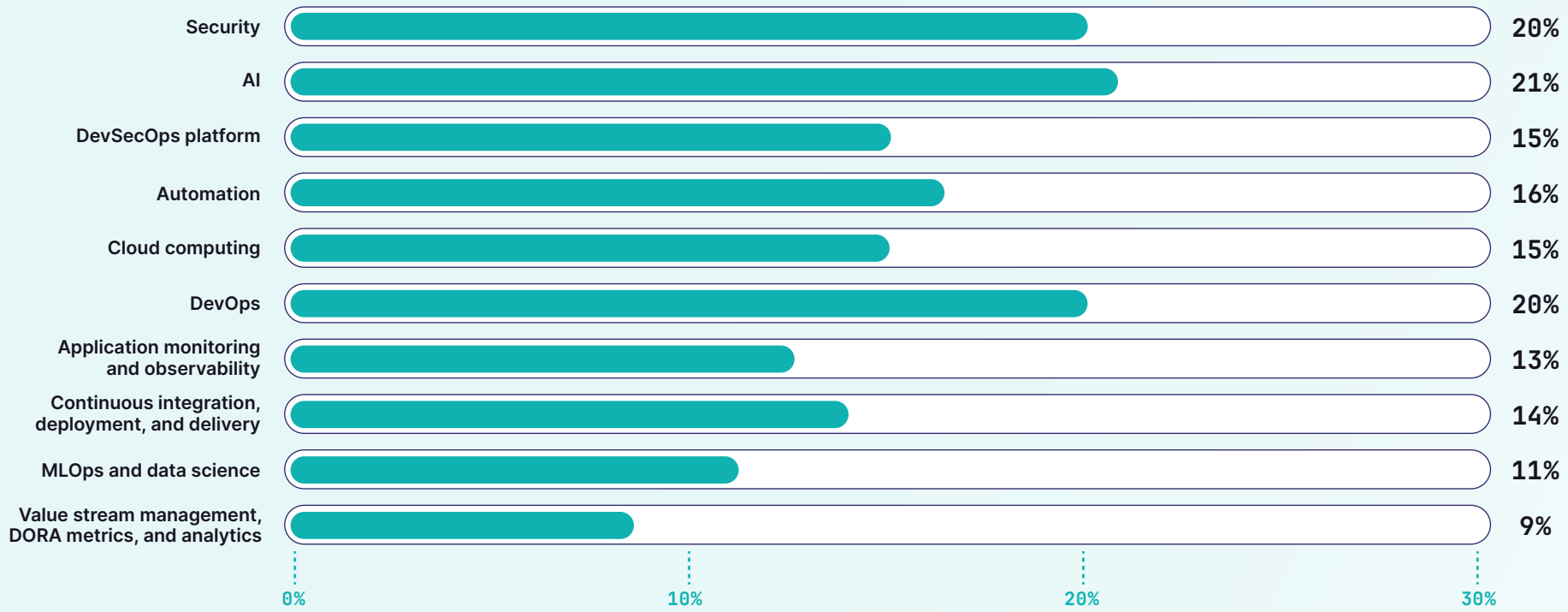

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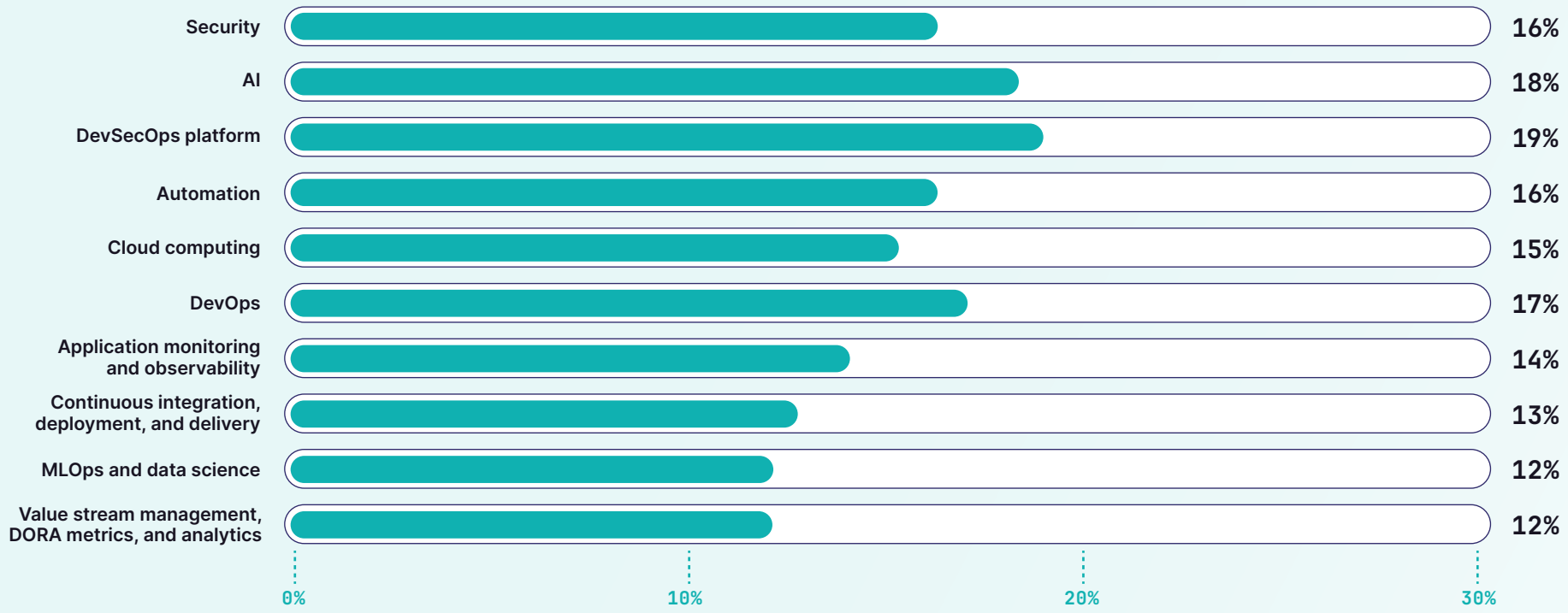

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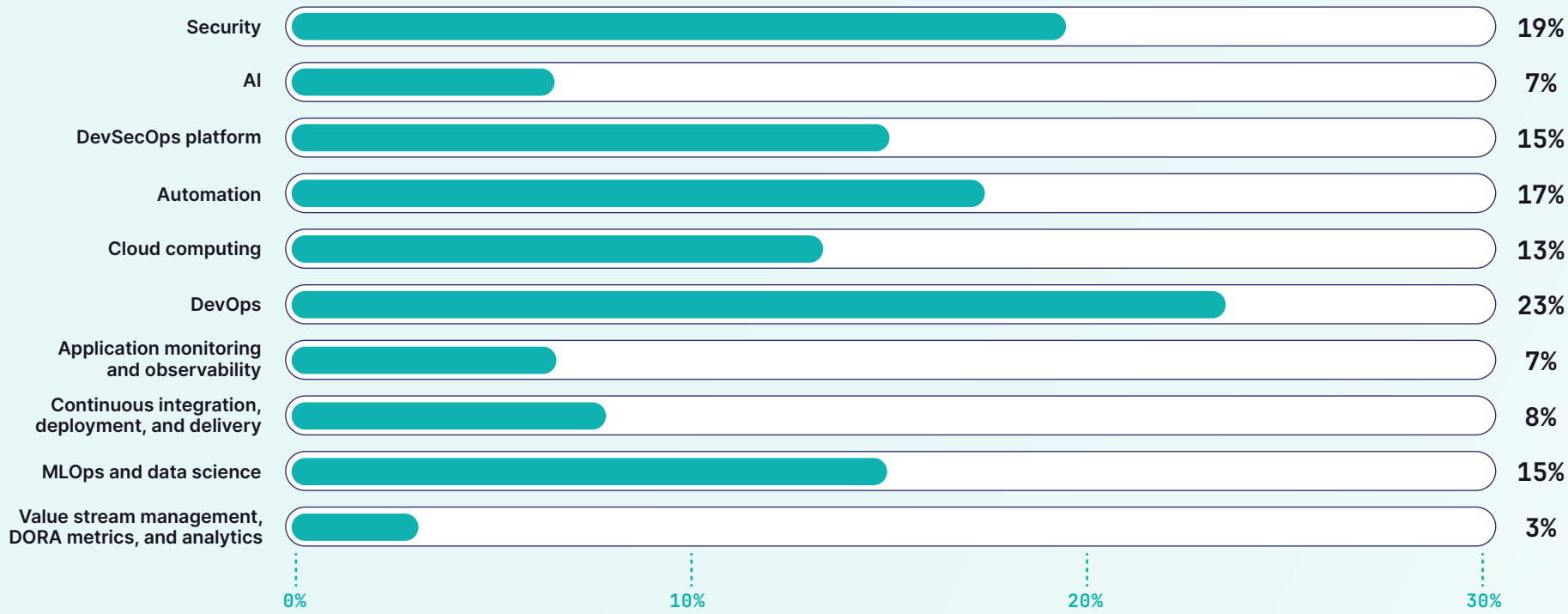

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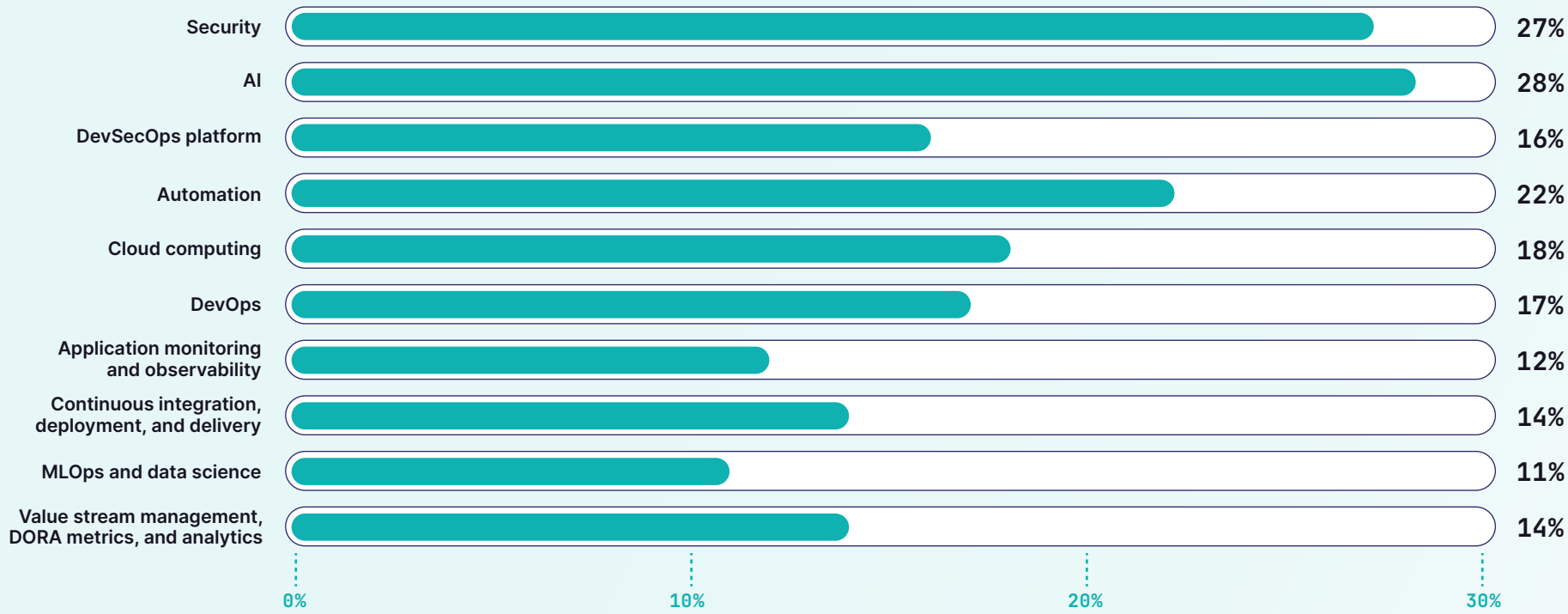

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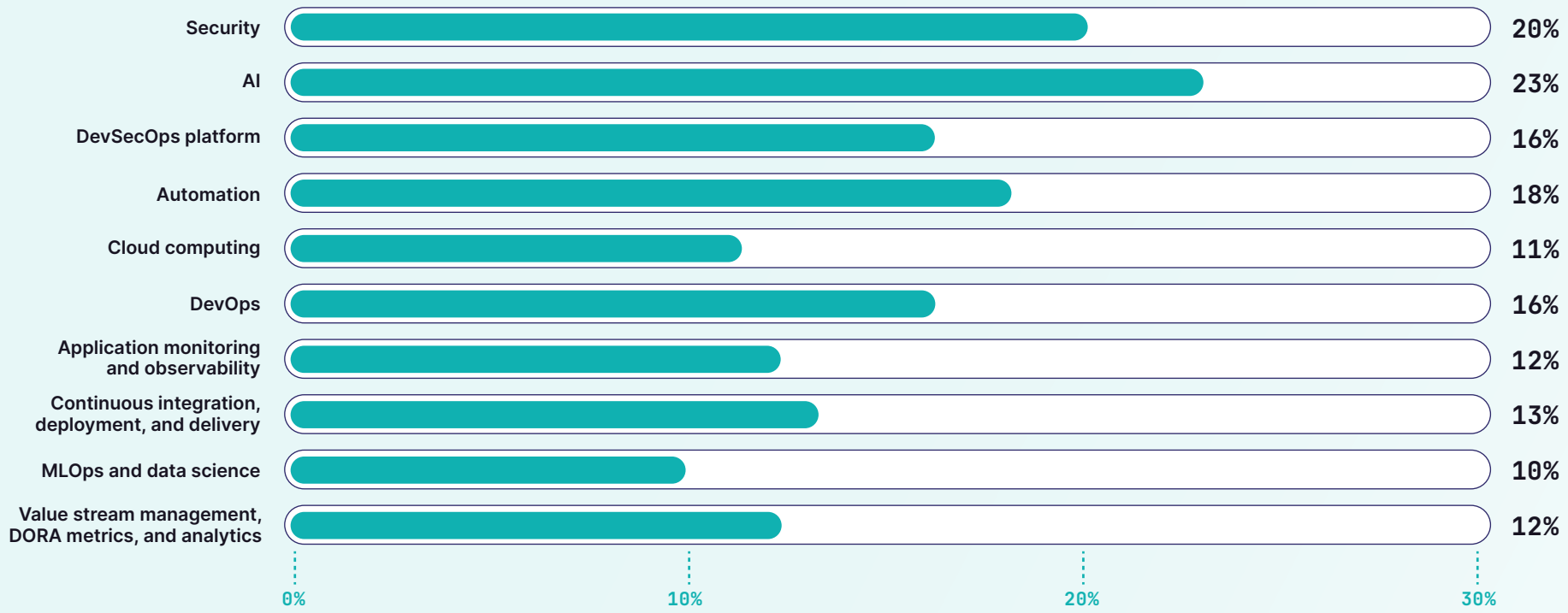

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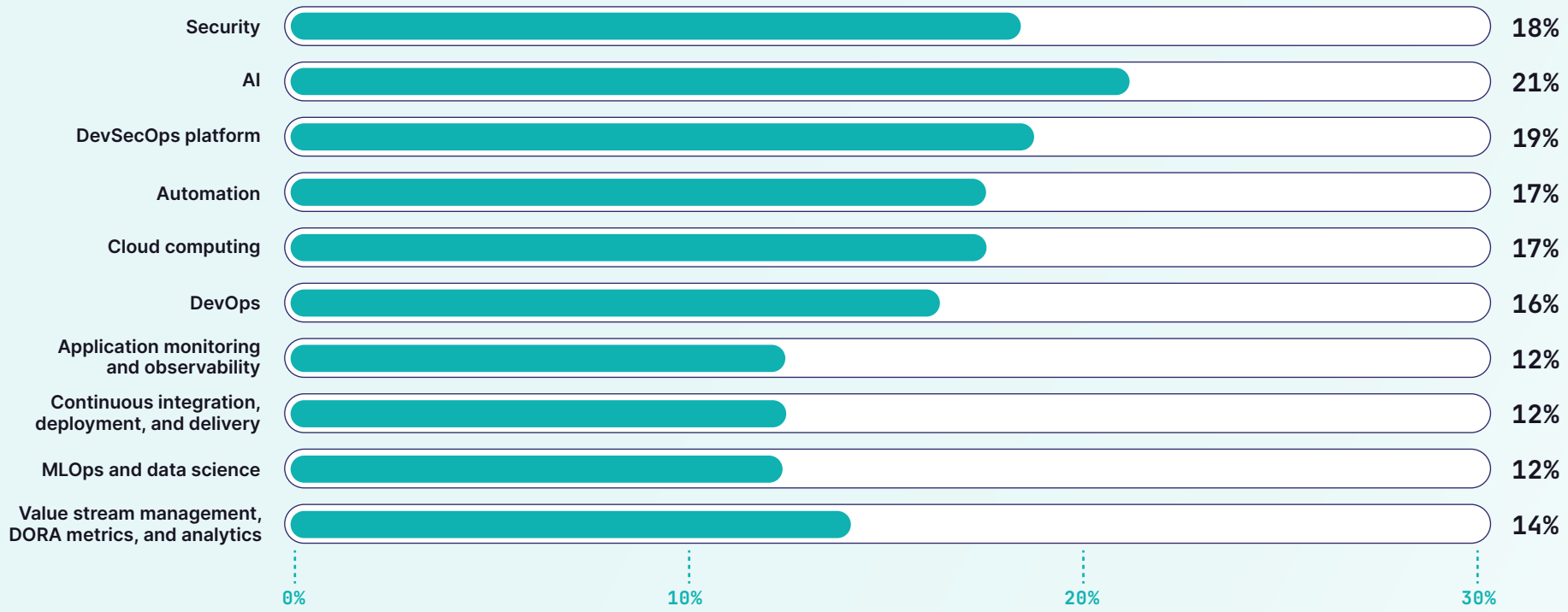

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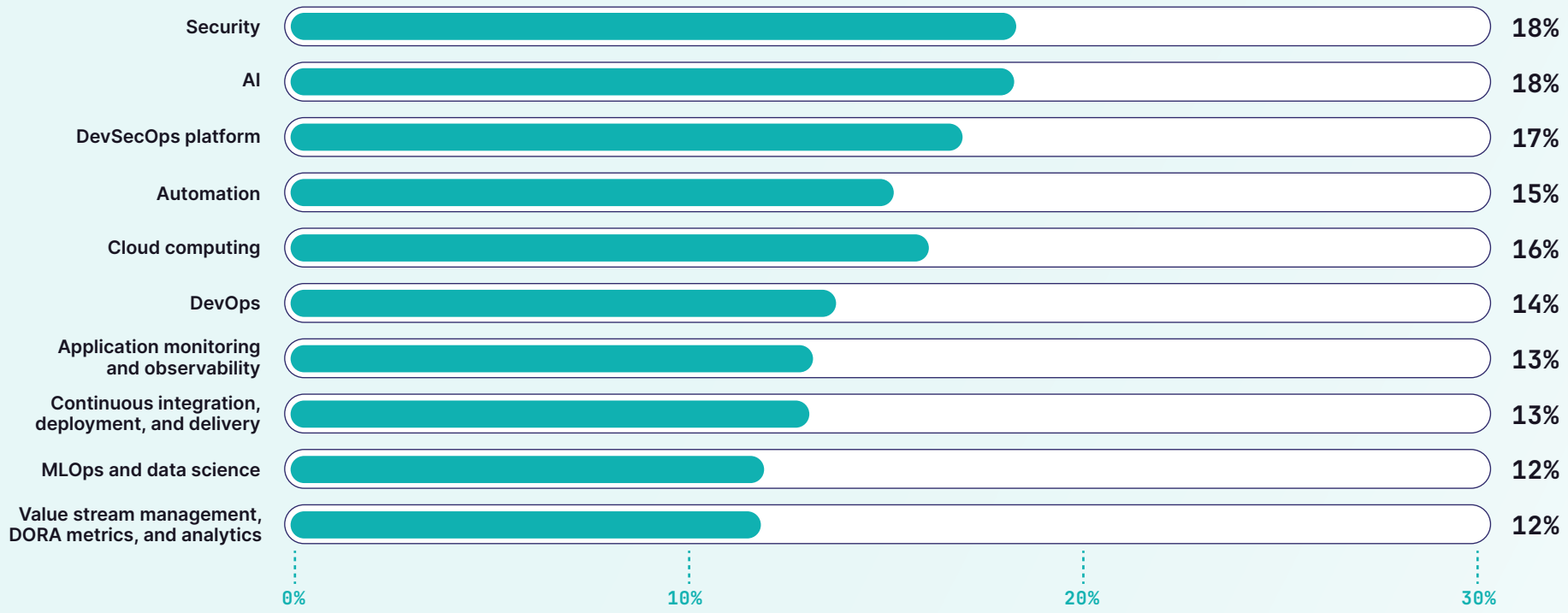

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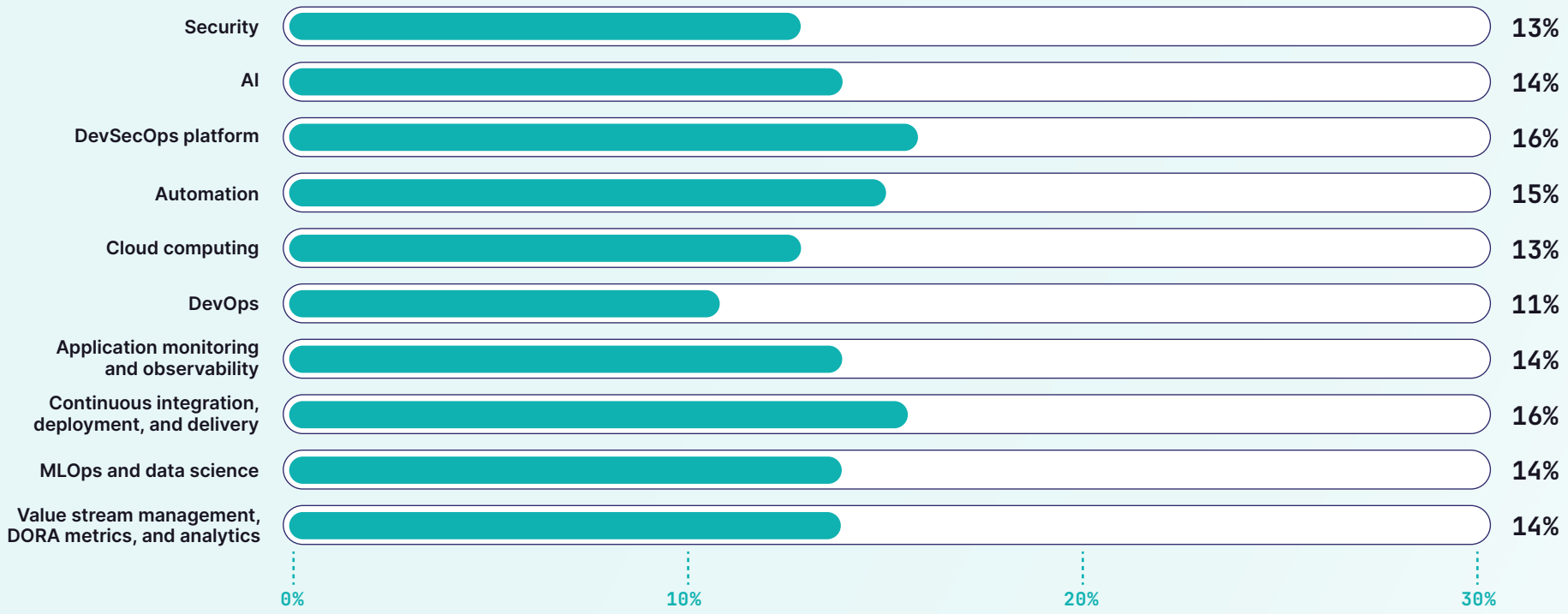

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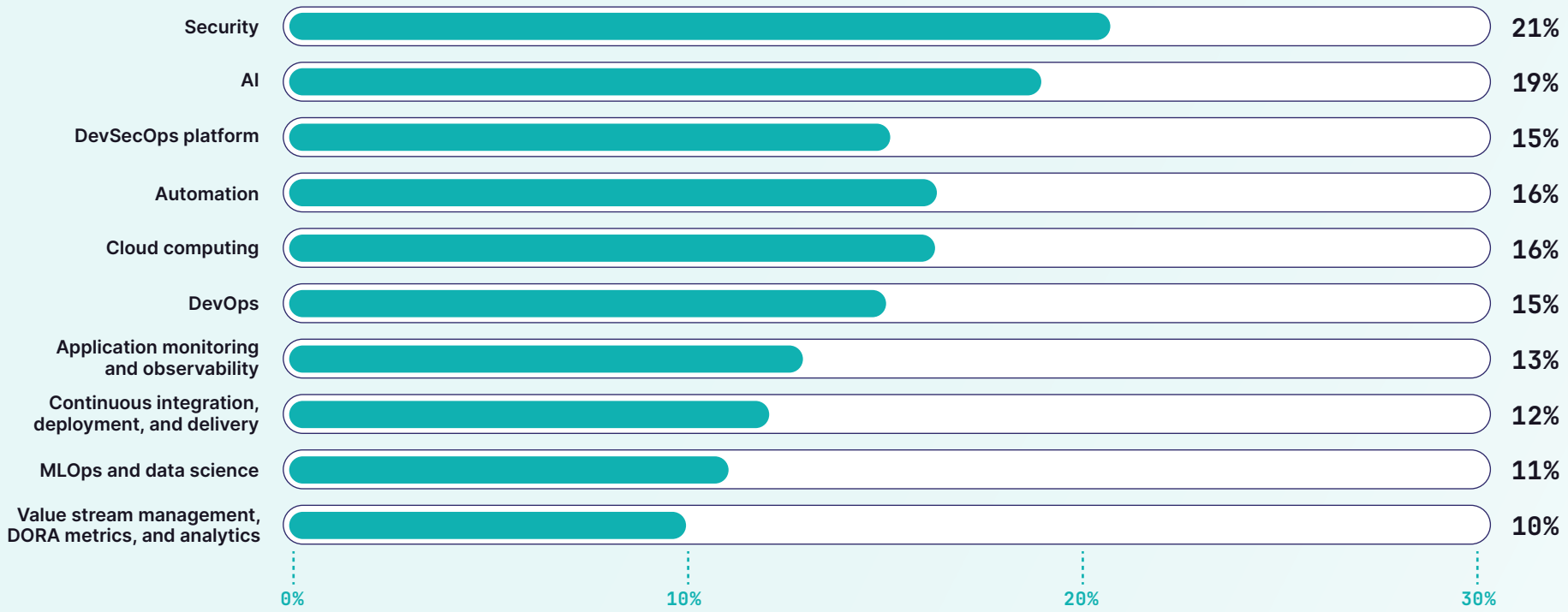

Highly regulated industries are doubling down on security

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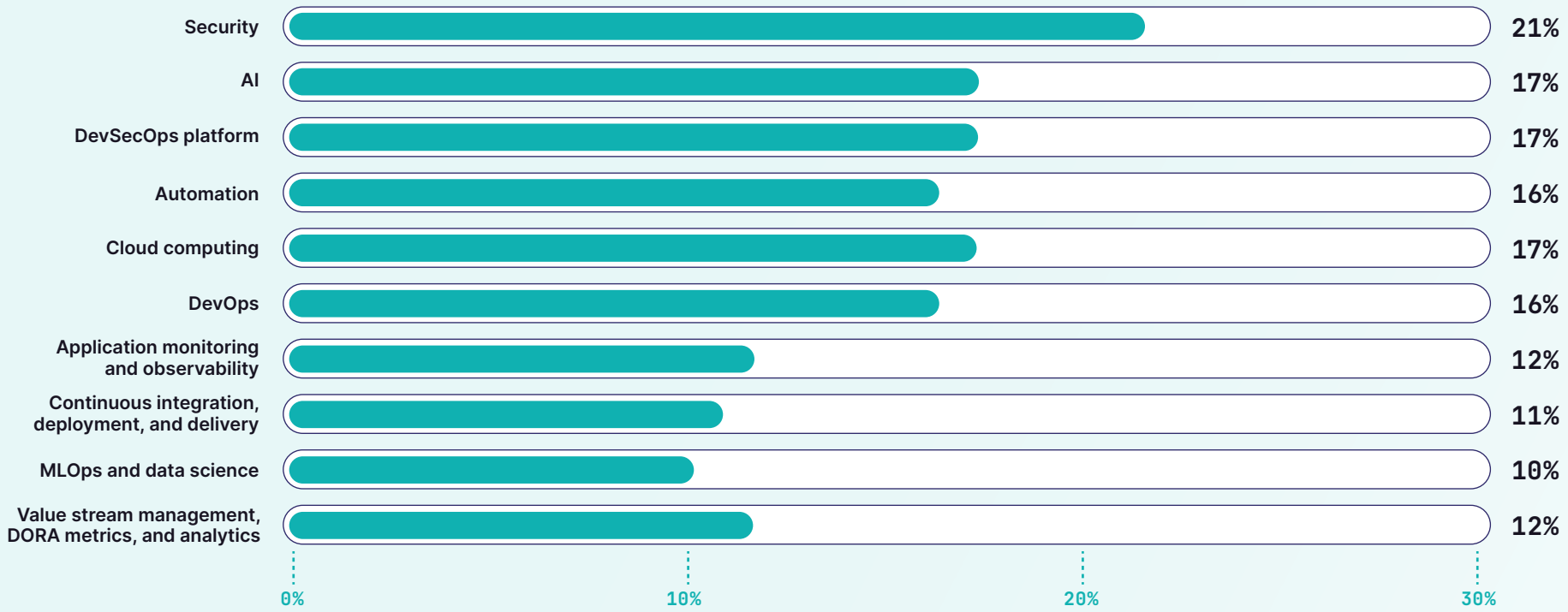

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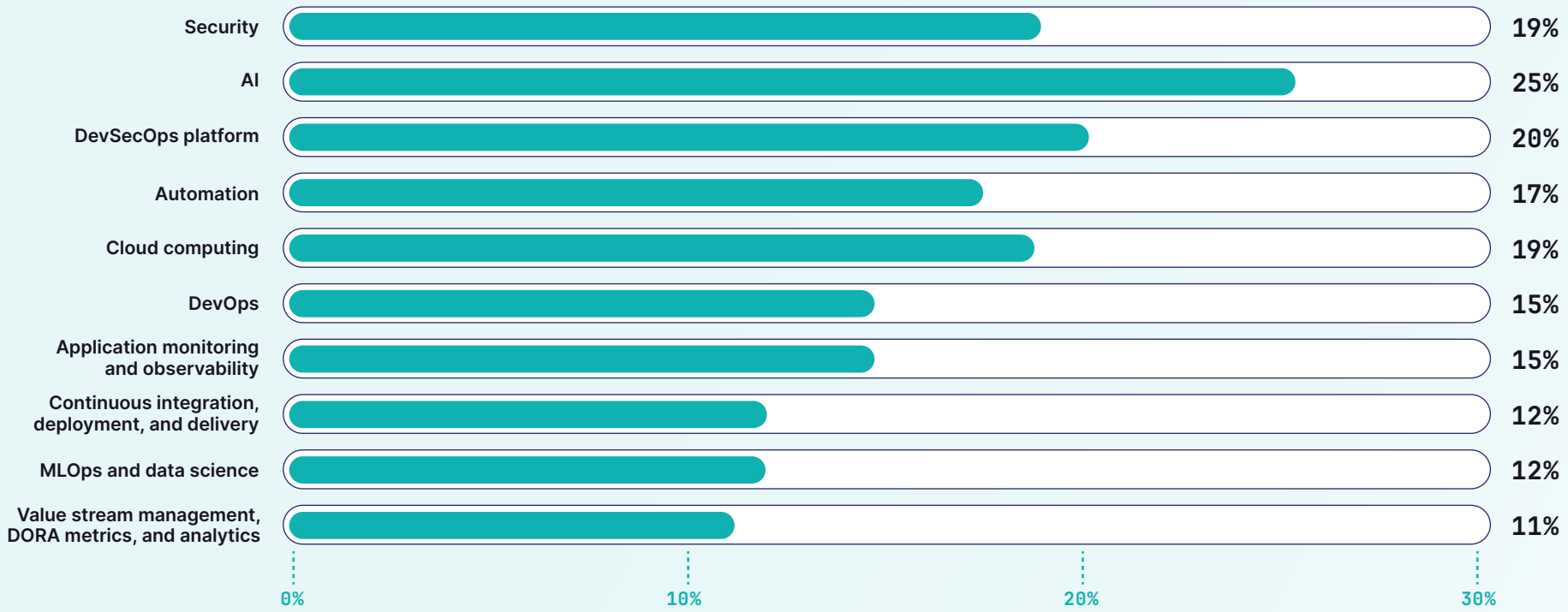
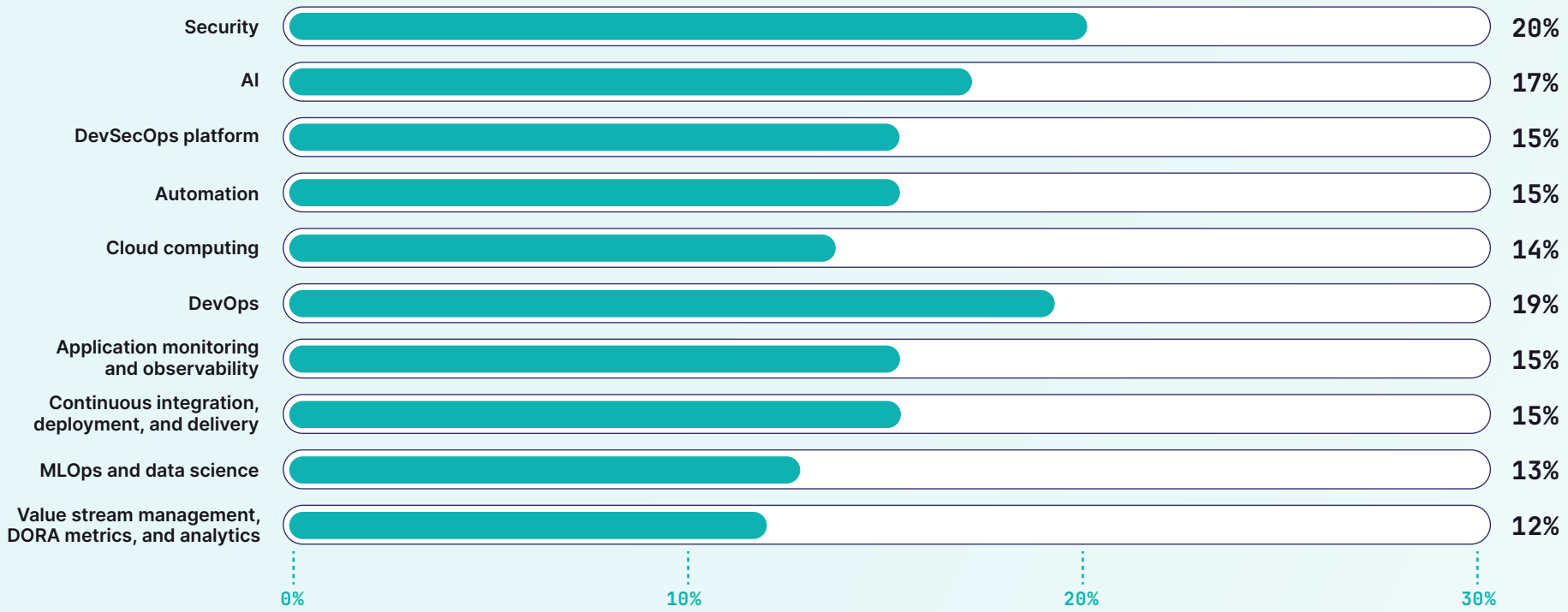


Tech leads the way on AI

Software, SaaS, and computer hardware organizations were the most enthusiastic about AI, with a quarter of respondents identifying AI as a top priority.

Industry trends Top IT investment priorities

Automotive	Financial services	Public sector	Software/SaaS/ Computer hardware	Telecommunications



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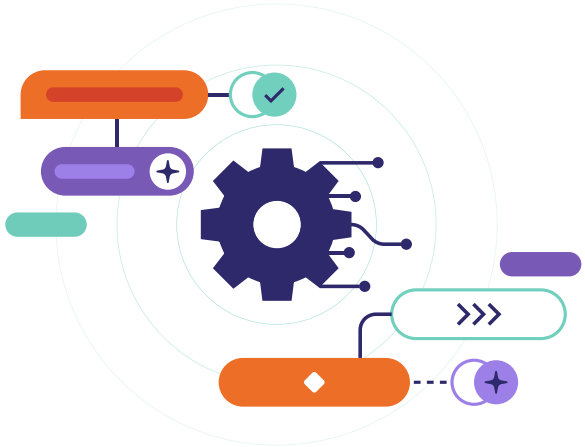
The time for AI is now — but adoption should be intentional

As we noted last year, DevSecOps professionals are optimistic about AI, and adoption of AI in the software development lifecycle is picking up speed. However, this year's data highlights several areas that organizations should watch to ensure that the introduction of AI is as productive as possible.

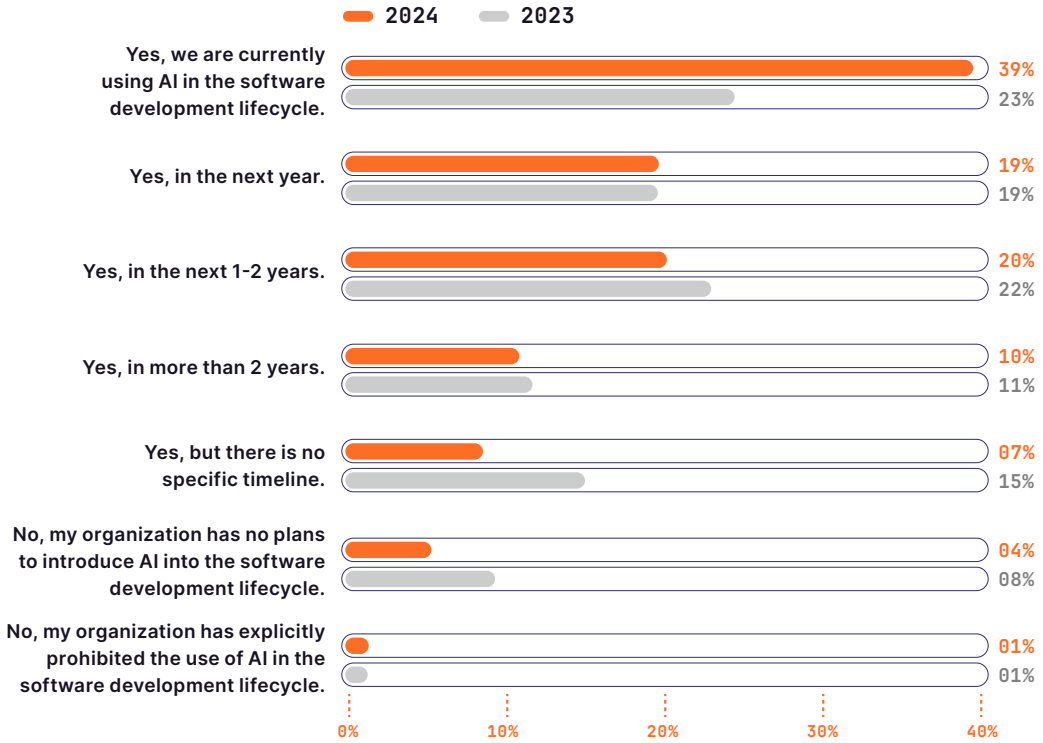
AI is now a "must have"

This year, 78% of respondents said they are currently using AI in software development or plan to in the next 2 years, up from 64% last year; 39% of respondents said they are already using AI, up from 23% last year. There was also a corresponding decrease in the number of respondents who said their organizations have no plans to use AI.

These findings suggest that the use of AI for software development is now status quo — and not adopting AI is becoming a less viable option for many organizations, even those that were initially hesitant.



Is your organization using or planning to use AI in the software development lifecycle?



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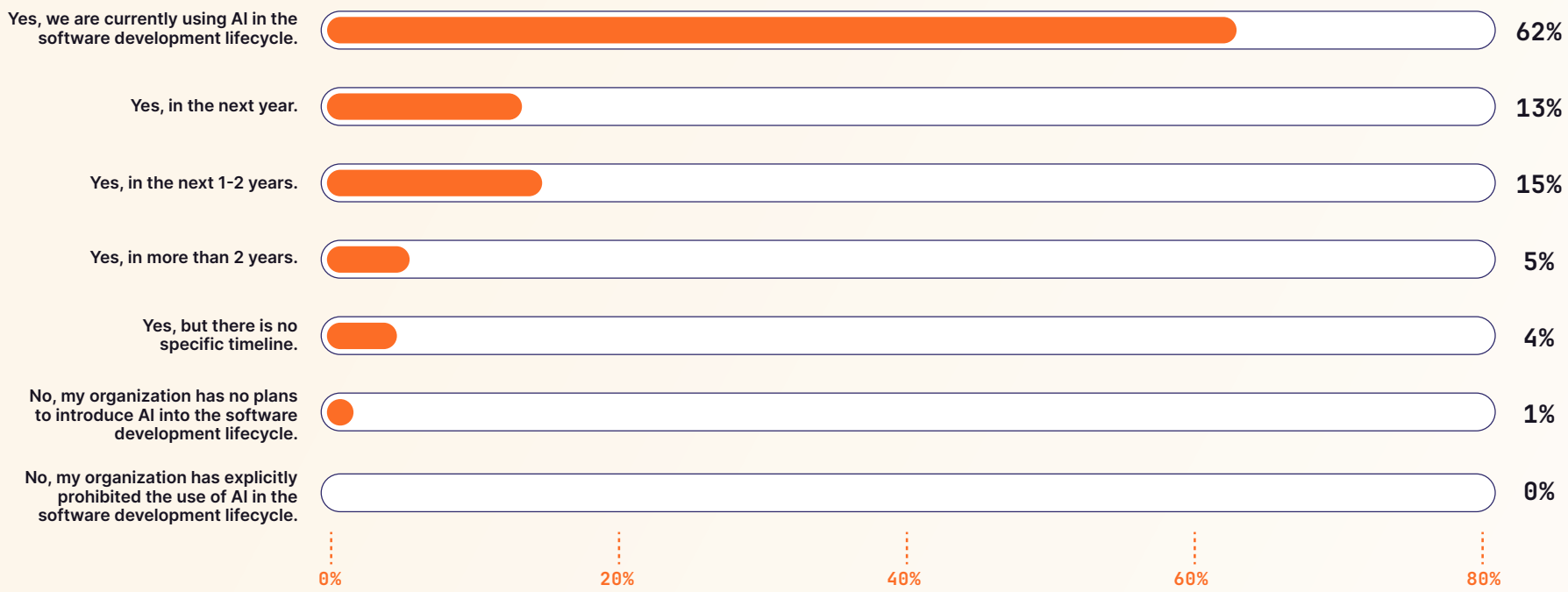

Are the U.S. and U.K. lagging behind?

Nearly two-thirds of respondents in the U.S. and the U.K. agreed that incorporating AI into software development is essential. However, both the U.S. (34%) and the U.K. (31%) had significantly lower rates of AI adoption than Australia (62%), Germany (53%), France (48%), and Japan (48%).

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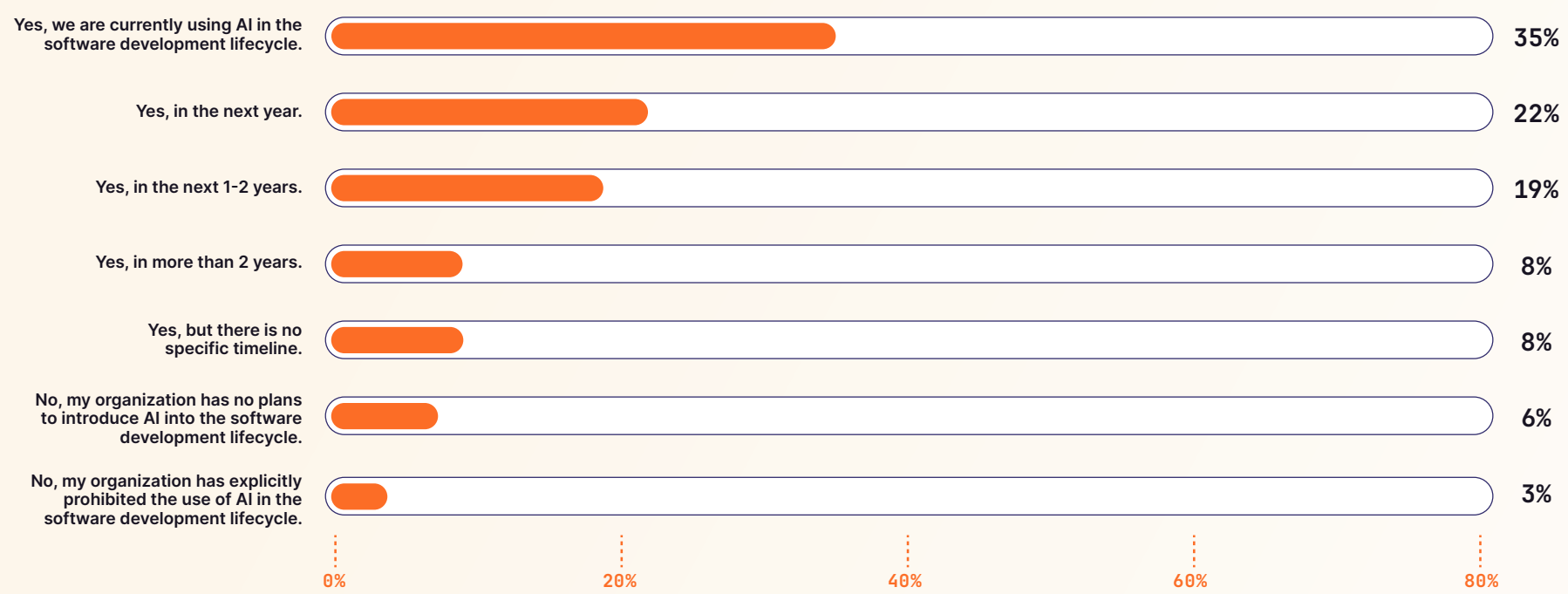

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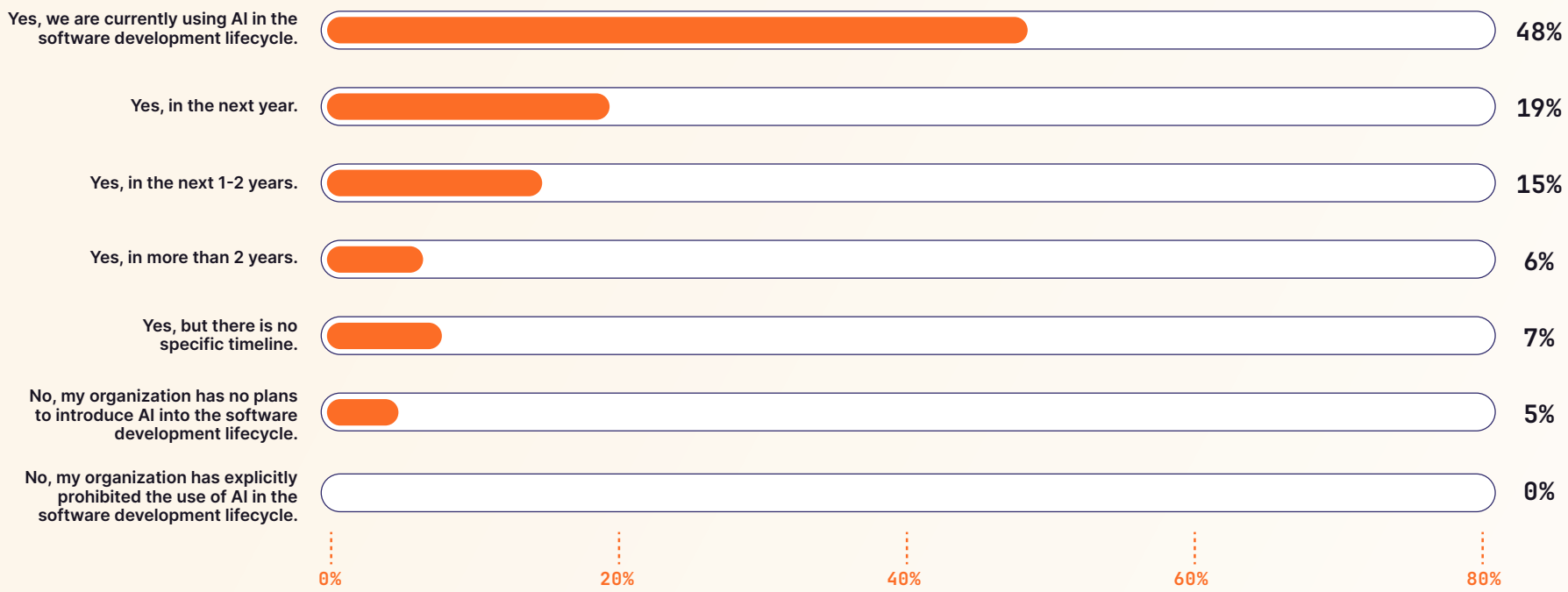

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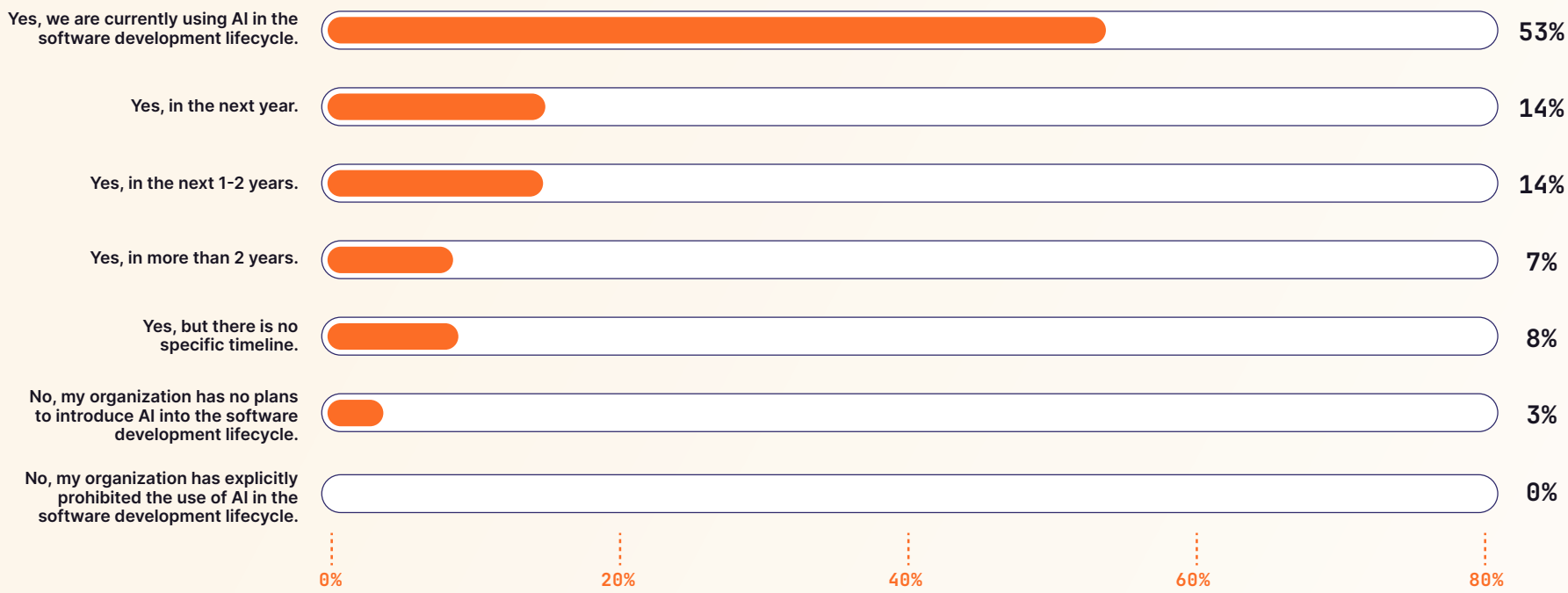

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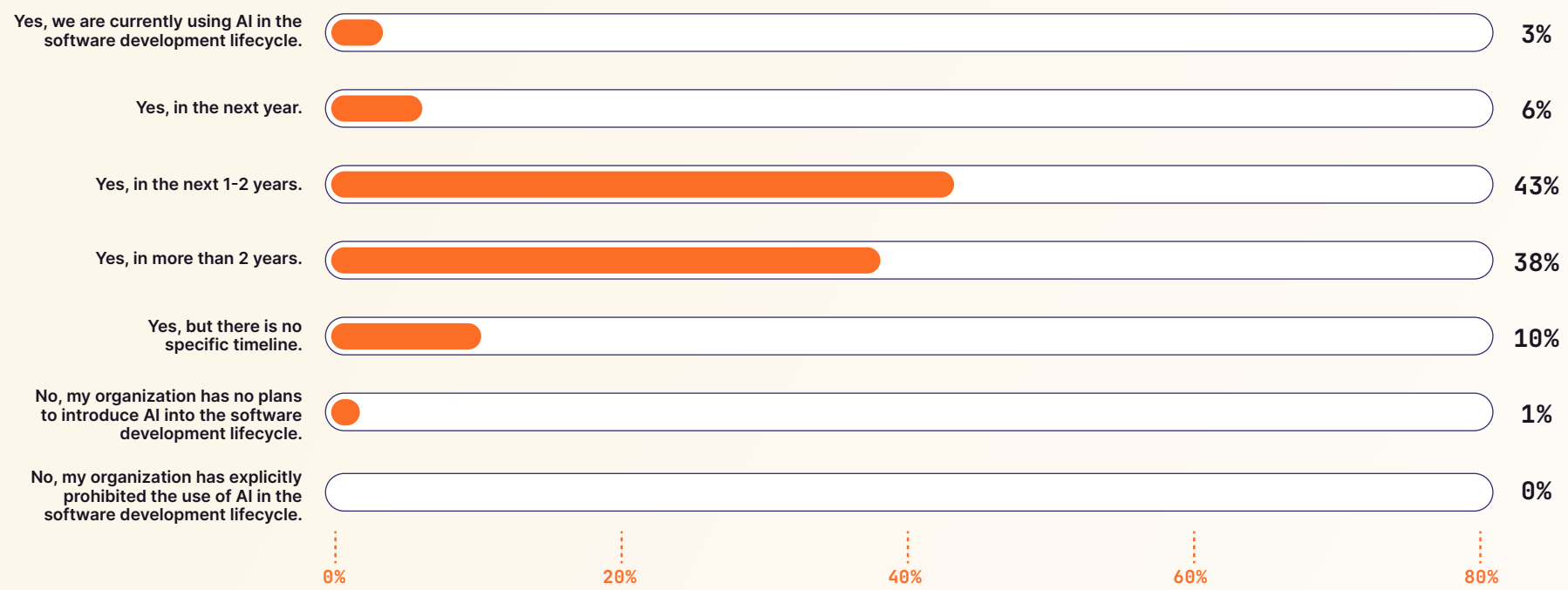

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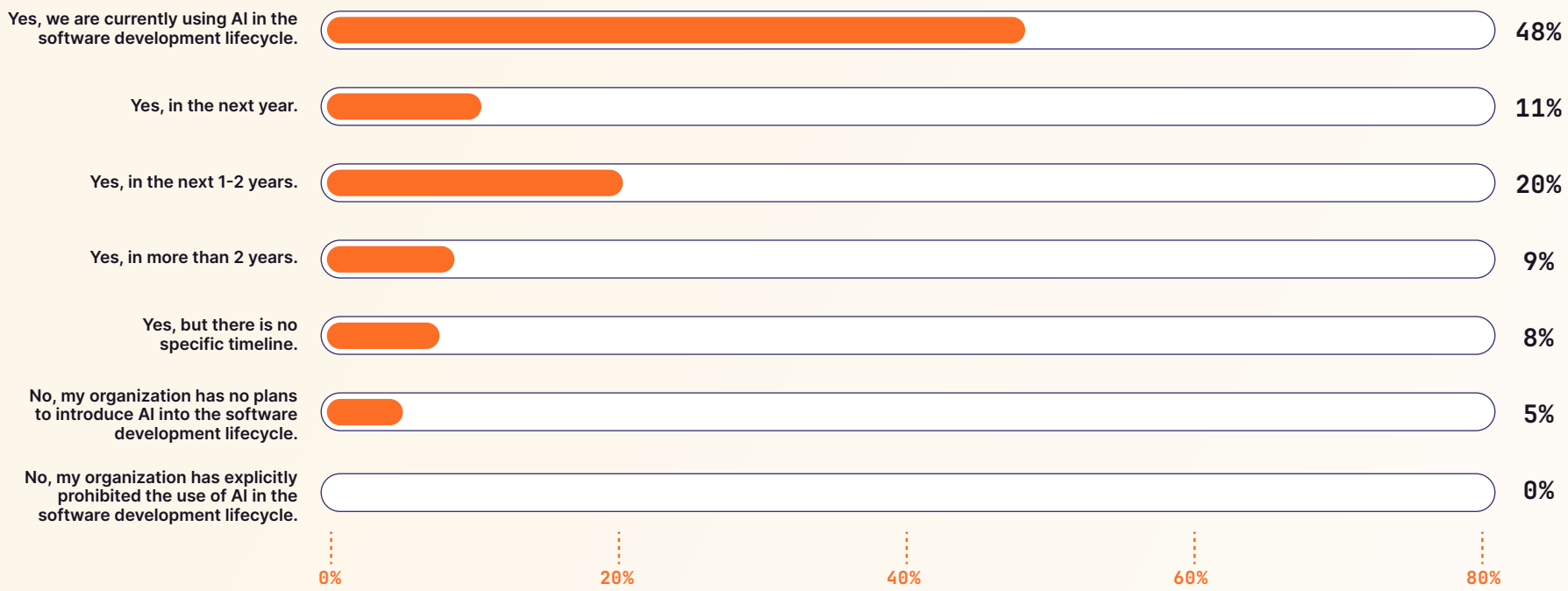

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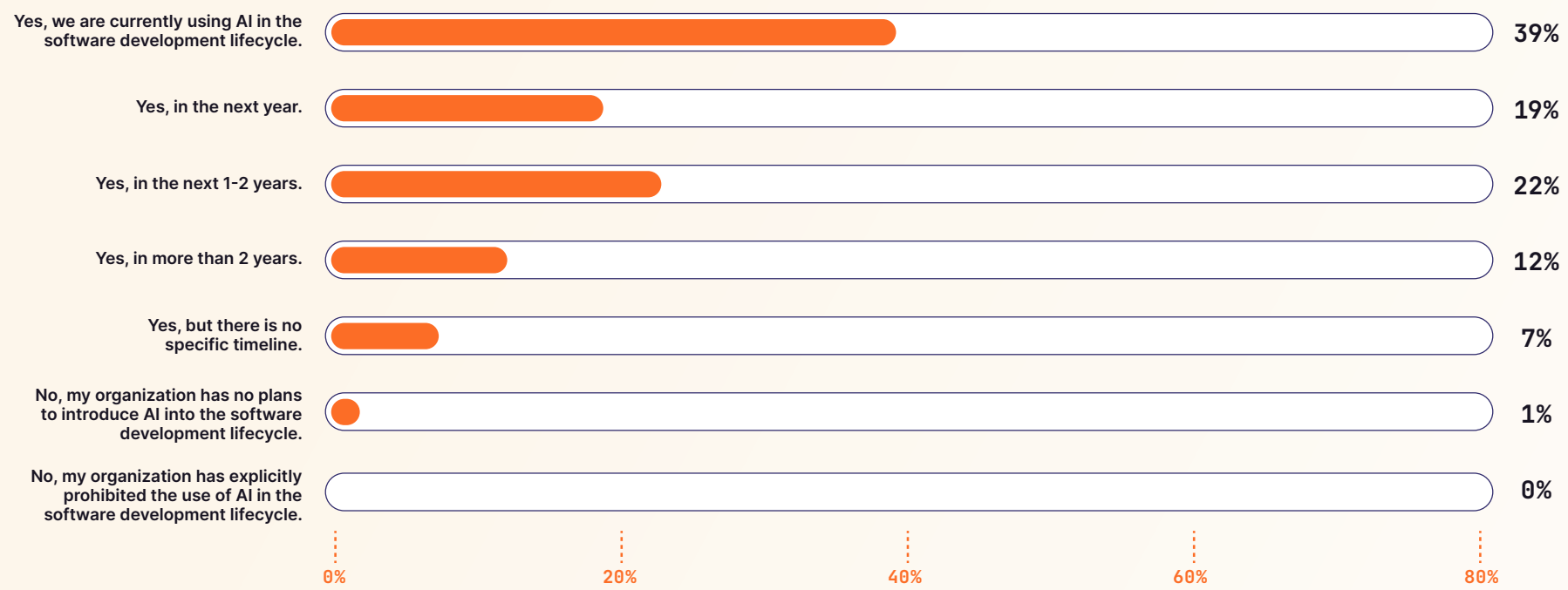

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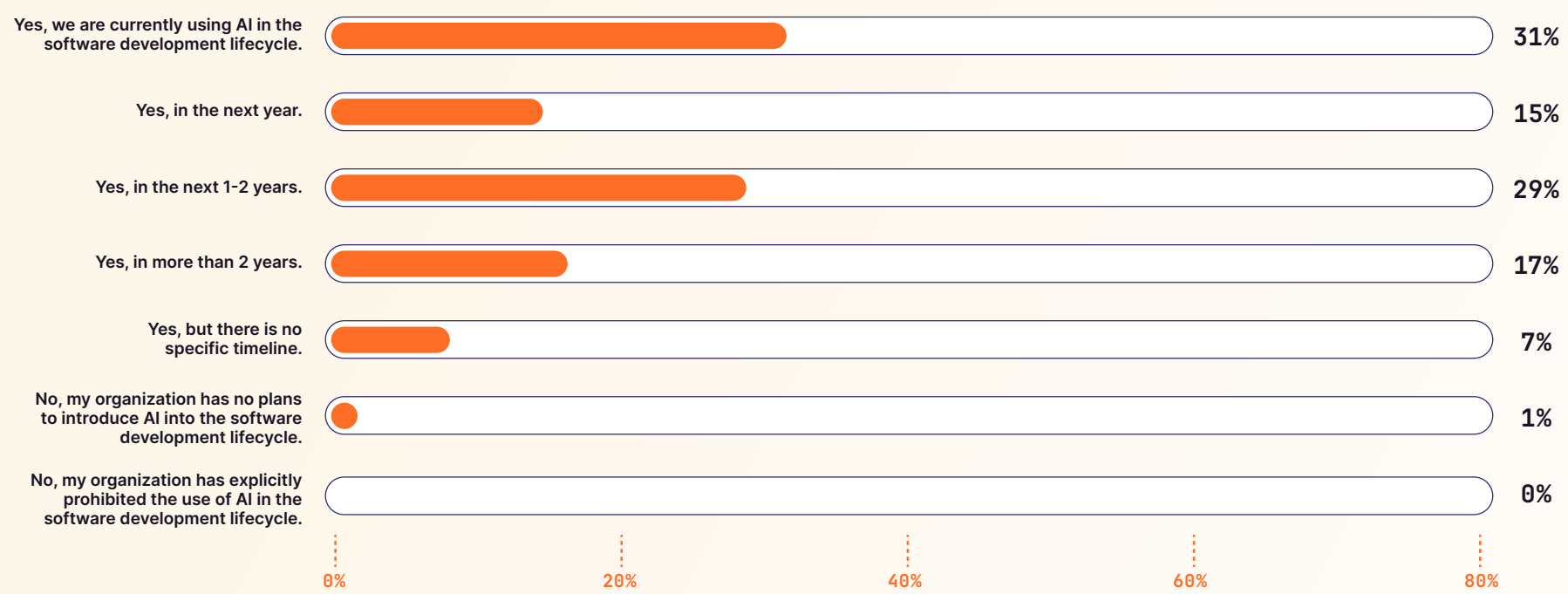

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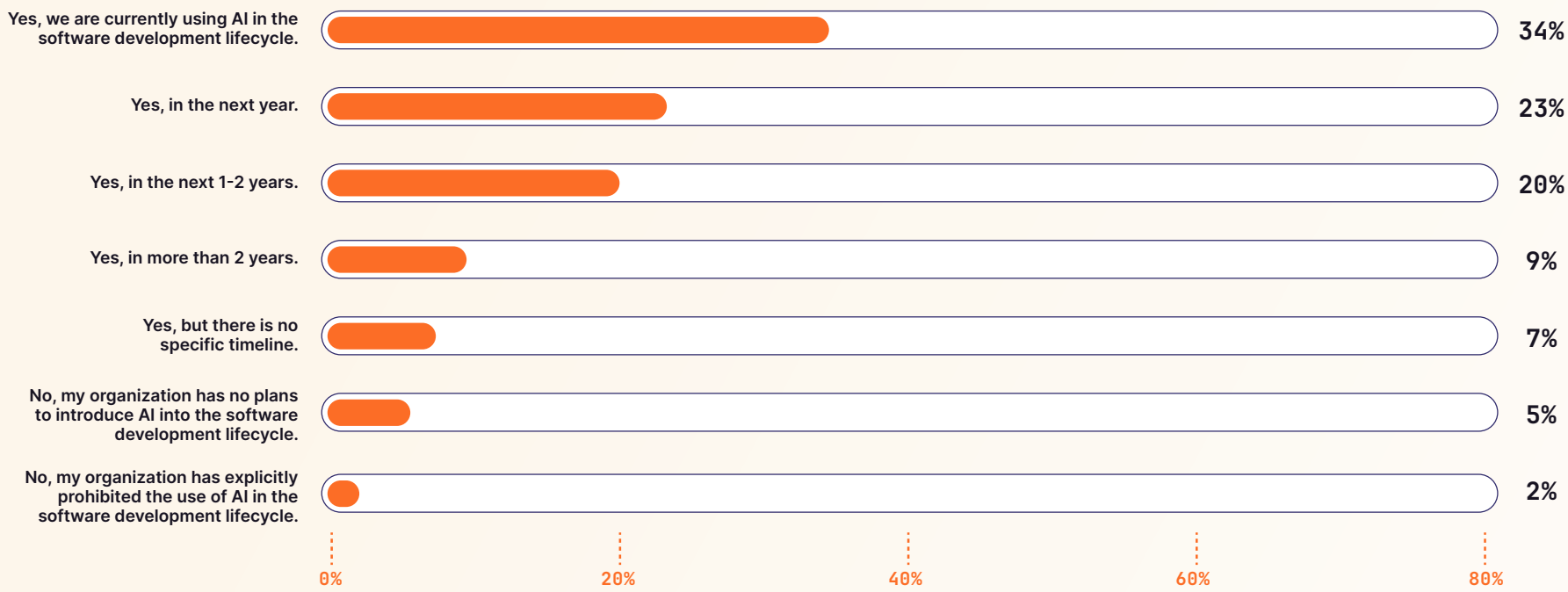

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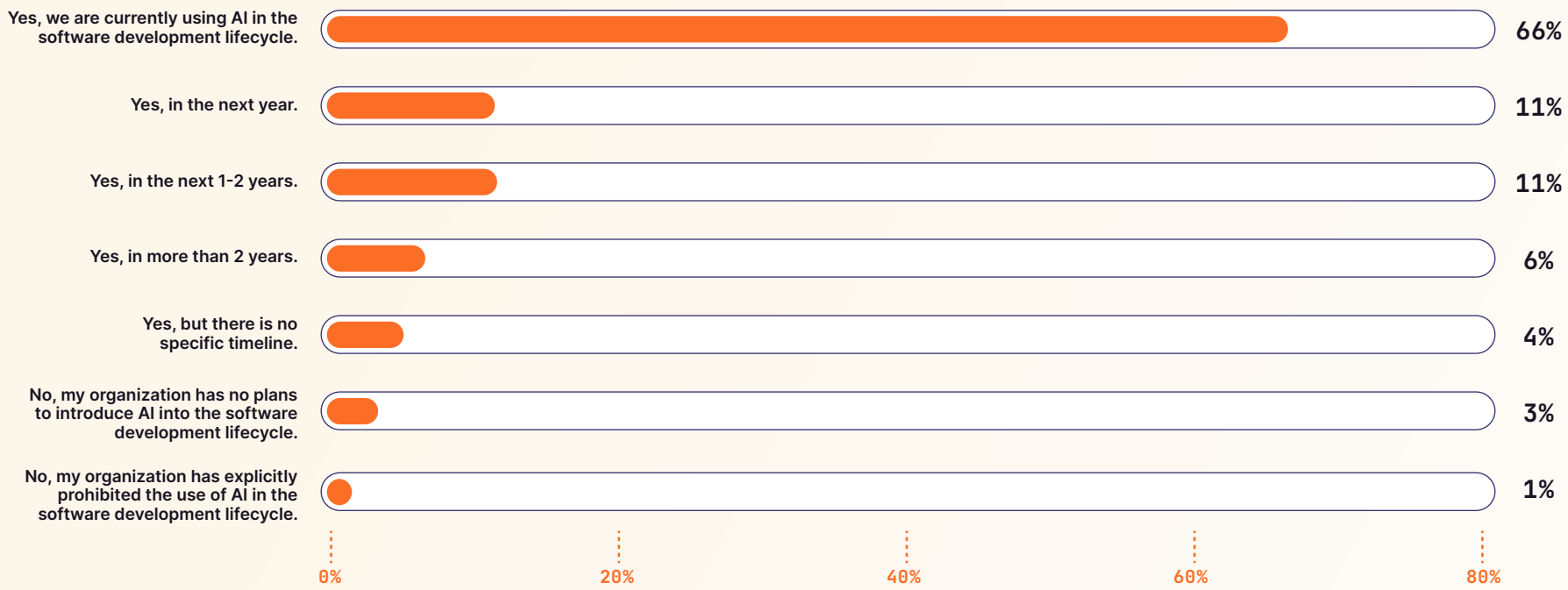

Automotive and the public sector accelerate on AI

Of the industries included in our survey, the automotive industry was the furthest along in AI adoption, with 66% of respondents saying that they are already using AI for software development. The public sector also showed high adoption, with nearly half (47%) of public sector respondents indicating that they are currently using AI.

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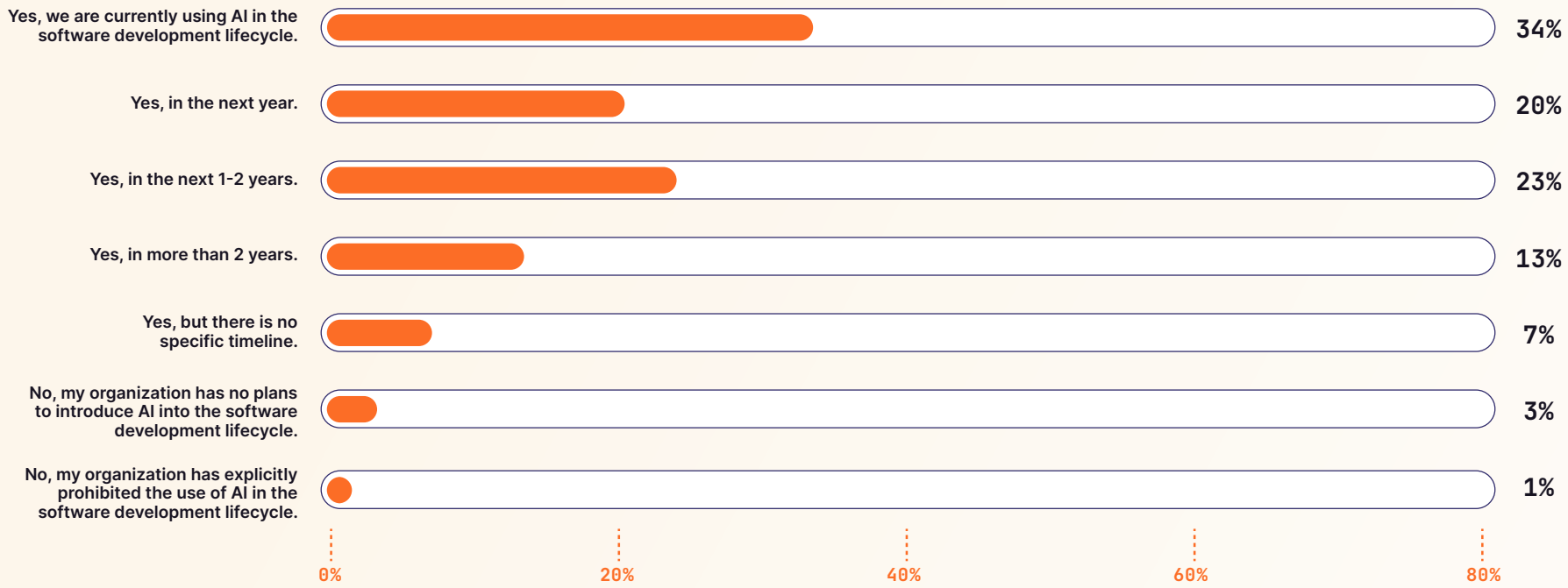

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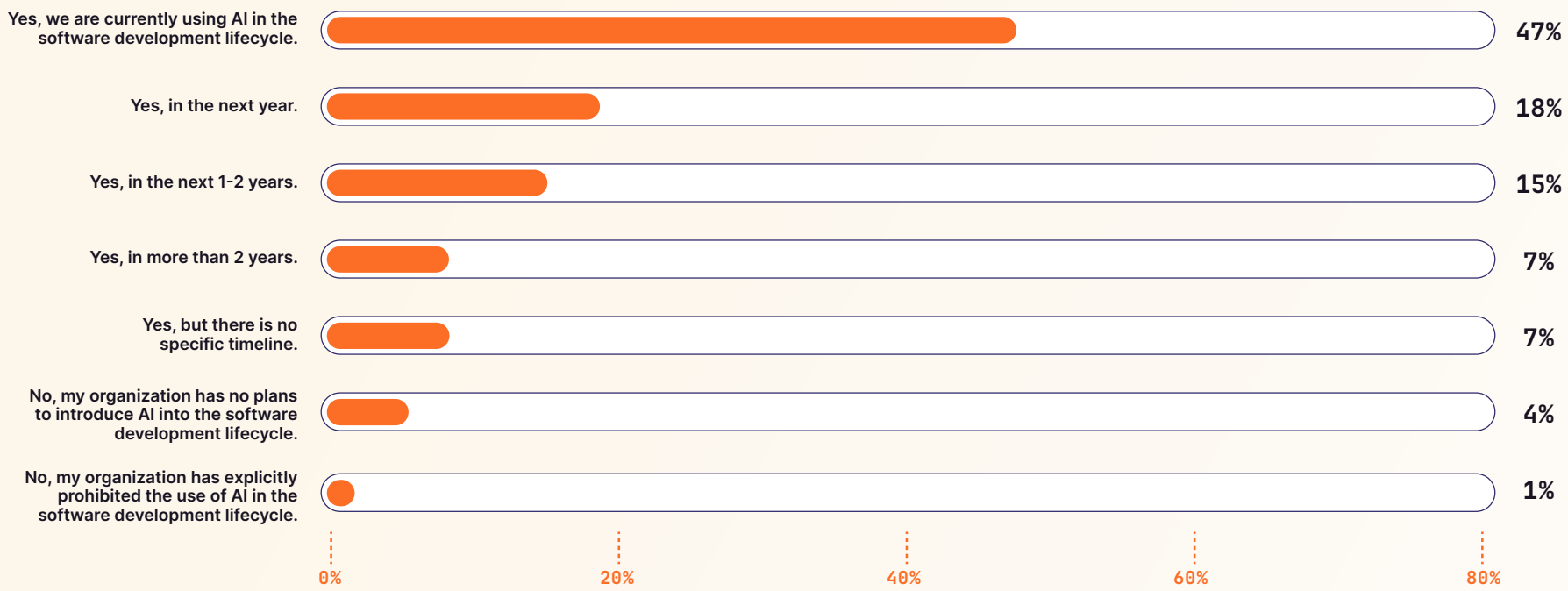

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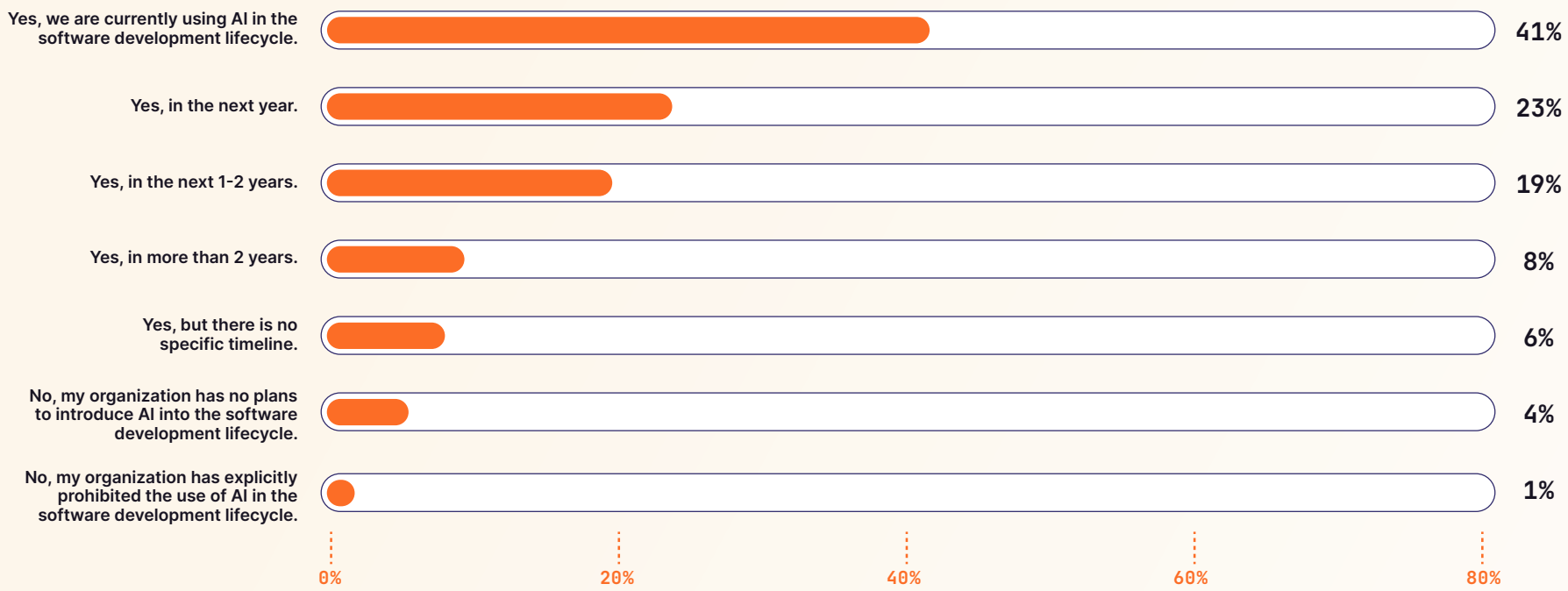

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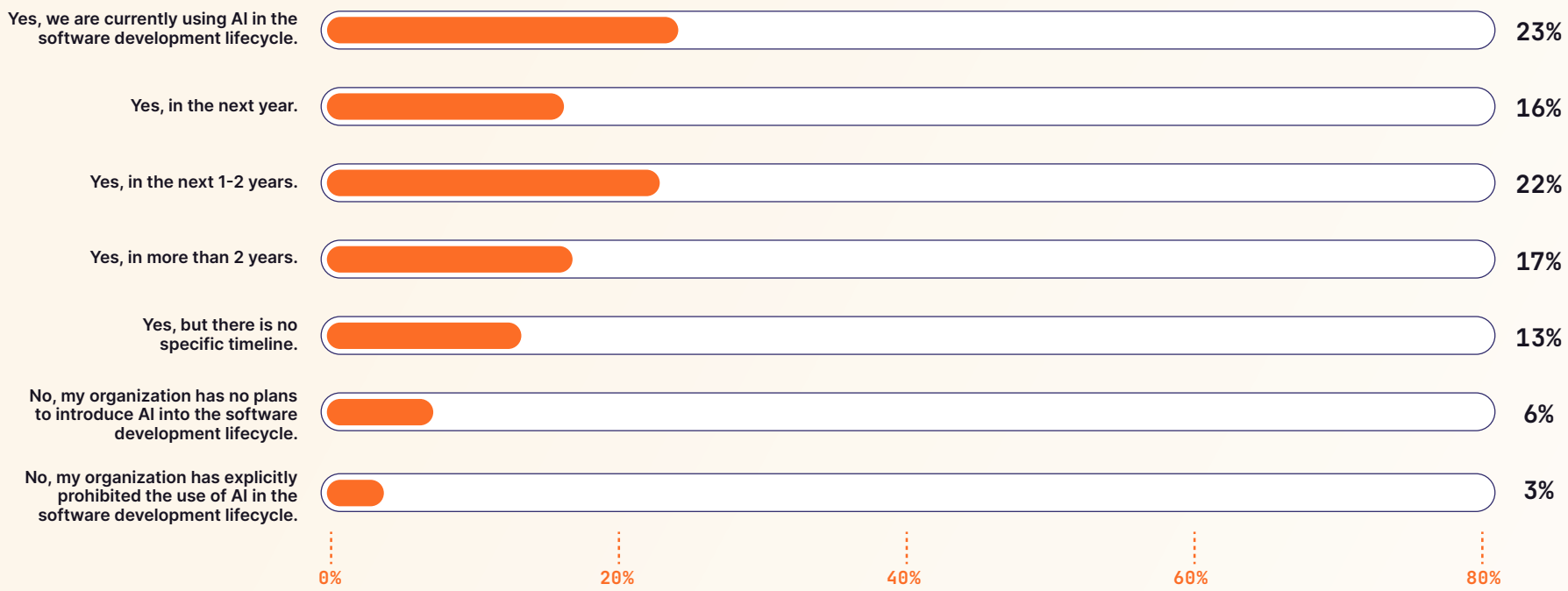


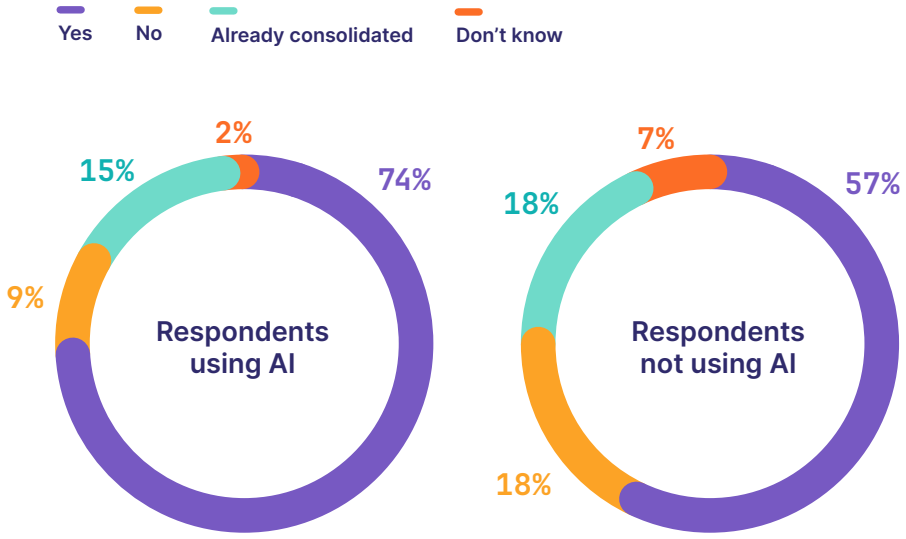
Toolchains in the age of AI

How is the rapid introduction of AI tools impacting DevSecOps teams' day-to-day? As one metric for how teams feel about their existing tools, we asked them whether they want to consolidate their toolchain.

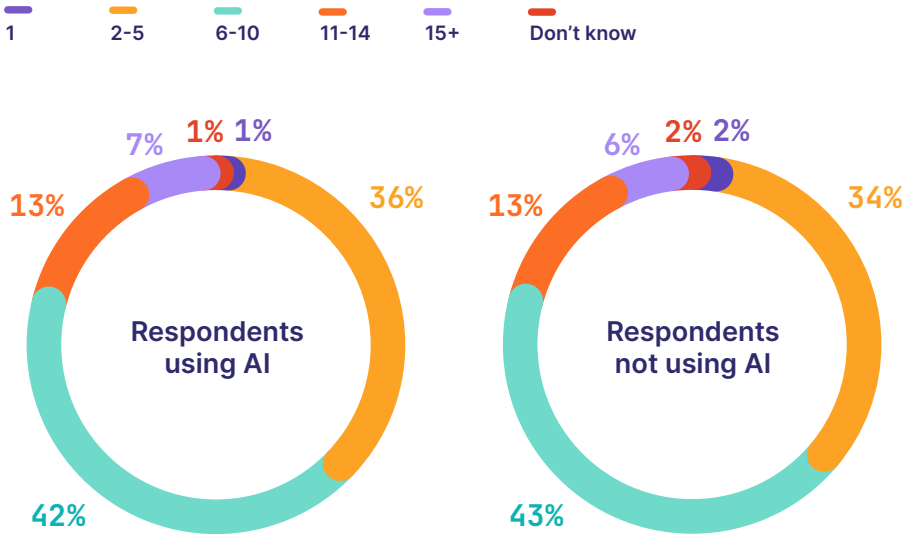
Nearly three-quarters (74%) of respondents whose organizations are currently using AI for software development said they wanted to consolidate their toolchain, compared to 57% of those who aren't using AI. However, there wasn't a significant difference between the two groups in the number of tools respondents actually reported using.

Why would AI accelerate the desire to consolidate? One explanation could be that the rapid adoption of AI is simply shedding new light on organizations' already cumbersome and counterproductive toolchains. In many cases, AI is only as valuable as the data available to it — so more tools in the toolchain means more tools an AI solution will need to integrate with. Teams get more value out of AI when toolchains are smaller, making it easier to integrate AI across the entire software development lifecycle.

Do you want to consolidate your toolchain?



How many tools does your team use for software development?



Teams want AI integrated into all aspects of software development

As we observed last year, software engineering teams are eager to adopt generative AI to help them accelerate code creation. This year, code generation and code suggestions (47%) again topped the list of software development use cases where respondents were interested in applying AI, followed by explanations of how code works (40%) and summaries of code changes (38%).

When asked how they are planning to use or interested in using AI, this year's respondents identified a different set of use cases, including forecasting of productivity metrics and identification of anomalies (38%), explanations of how a vulnerability can be exploited and how to remediate it (37%), and chatbots that allow users to ask questions in natural language (36%).

Chatbots appeared in both the top five current use cases and the top five use cases that respondents were interested in, suggesting that natural-language chat interfaces are an appealing way for DevSecOps teams to engage with AI tools.

Top ways respondents are currently using AI

47%

Code generation and **code suggestions/ completion**

40%

Explanations of **how a piece of code works**

38%

Summaries of **code changes**

35%

Chatbots that allow users to ask questions in **documentation using natural language**

35%

Summaries of **code reviews**

Top AI use cases respondents are interested in

38%

Forecasting **productivity metrics** and identification of anomalies across the **software development lifecycle**

37%

Explanations of how a **vulnerability can be exploited** and how to remediate it

34%

Suggestions for who can **review code changes**

36%

Chatbots that allow users to ask questions in **documentation in natural language**

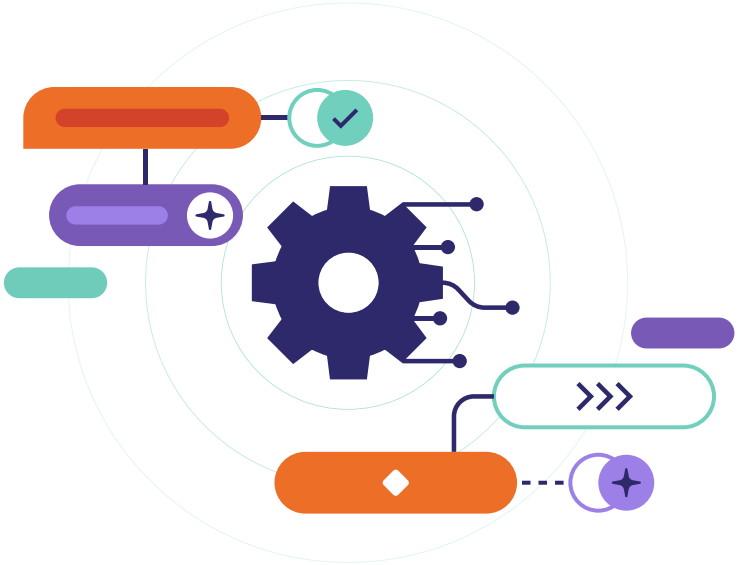
31%

Fixing failed **pipeline jobs**

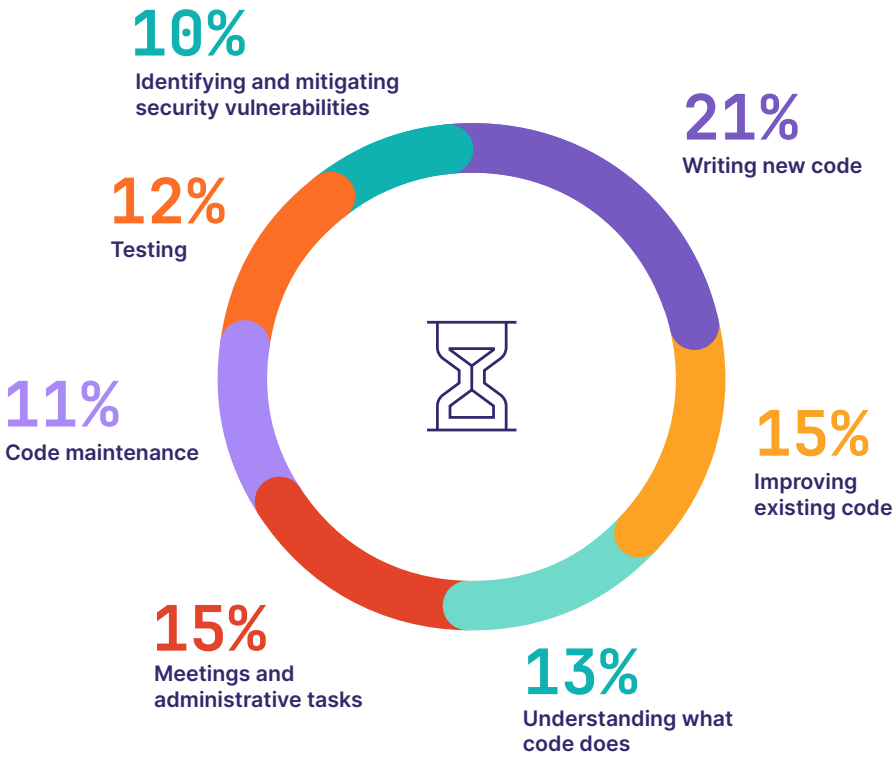
Unlocking AI's full potential

Although the code generation use case had the highest adoption rate in our survey — likely because this was the first to be introduced — our survey findings suggest that the real opportunity of AI lies not in single tasks but rather across the entire developer workflow.

As we observed in 2023, this year developers reported spending less than a quarter of their time writing new code, with the rest spent on meetings and administrative tasks (15%), improving existing code (15%), understanding code (13%), testing (12%), maintaining code (11%), and identifying and mitigating security vulnerabilities (10%). That represents over 75% of developers' day-to-day where AI — in the form of vulnerability explanations, code change summaries, automated tests, and more — can have an impact by introducing efficiencies and boosting productivity and collaboration.



Percentage of time developers spend on daily tasks

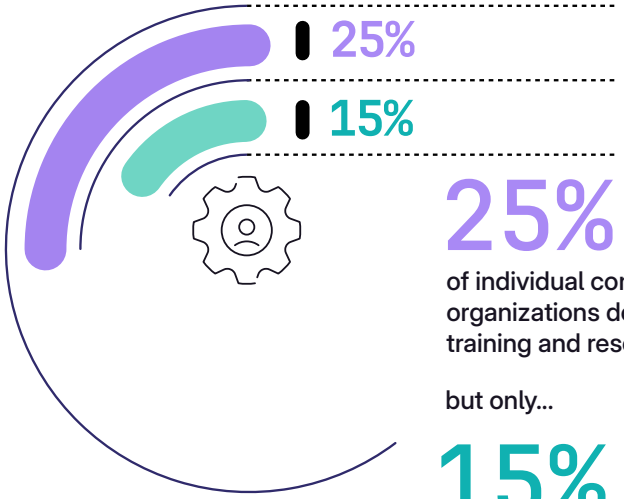


Executives are optimistic about AI, but need more visibility into teams' experiences

C-level executives expressed cautious optimism about AI this year, but were also cognizant of the risks of AI adoption: 62% of C-level respondents agreed that it is essential to implement AI in software development to avoid falling behind, while 56% agreed that introducing AI into the software development lifecycle is risky.

However, individual contributors and managers were significantly more likely than C-level executives to say that their organizations are unprepared to adopt AI. In addition, individual contributors were significantly more likely than C-level executives to say that their organizations do not provide adequate training and resources for using AI. This could suggest that organizational leaders lack visibility into the reality of AI adoption on the ground — or that organizations are making a top-down attempt to make AI resources available to employees, but those resources may not be adequate, or some employees may not be aware of them.

How can leaders get more visibility into how their teams are adapting to using AI? One answer is to incorporate AI tools into a single data store that touches all stages of software development — for example, through a DevSecOps platform — so leaders can leverage capabilities such as AI impact reporting to understand how teams are using AI and where it's introducing efficiencies, as well as where teams may be struggling. That data can help executives monitor AI adoption and assess the benefits and business value of AI features.



25%

of individual contributors said that their organizations do not provide adequate training and resources for using AI...

but only...

15%

of C-level executives felt the same way.

Toolchains remain a barrier to developer experience

Great developer experience means removing obstacles so developers can onboard quickly and start creating value right away. Developer experience has been shown to help organizations accelerate innovation, enhance efficiency, and attract top talent. But the road to better developer experience isn't always a straight line — new technologies and trends can introduce efficiencies in some areas and complications in others. While organizations are making efforts to improve developer experience across the board, this year's survey revealed a number of potential stumbling blocks.

Top changes that could be made to improve developer satisfaction, according to developers

27%
Increased automation

24%
Improving collaboration

24%
Better pay

23%
Use of AI assistants

22%
More flexible work arrangements, such as remote or hybrid work

What developers want: Automation, collaboration, and AI

When asked how their organizations can improve developer experience, developers were clear: automation, collaboration, and use of AI tools topped the list, in addition to work considerations such as better pay and more flexible work arrangements.

As we've seen in the list of investment priorities, organizations seem to be listening, as they're increasing investments in automation, collaboration (in the form of DevSecOps platforms), and AI. In fact, more than half (67%) of respondents this year said their software development lifecycle is mostly or completely automated. In Europe, where our survey showed particularly rapid AI adoption, this was notably higher, at 72%.

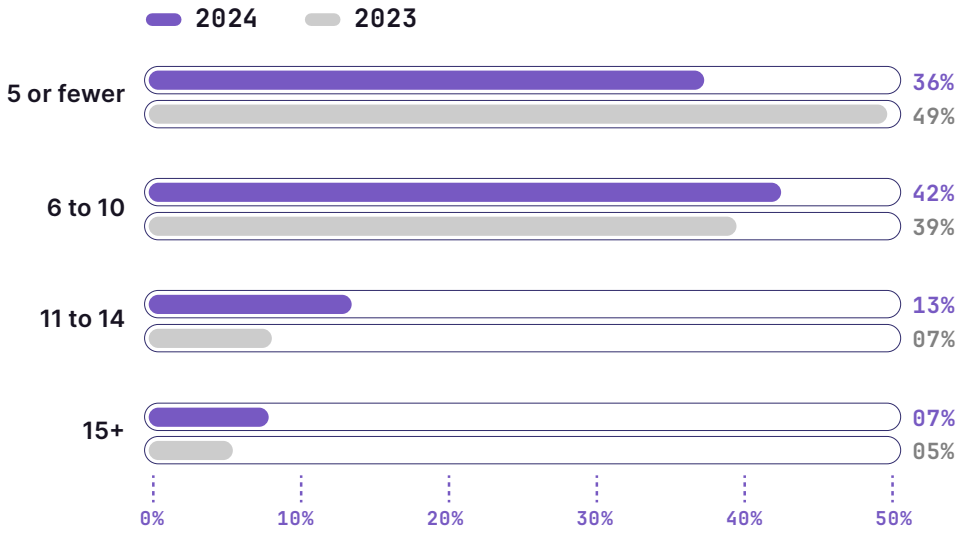
67% respondents said their software development lifecycle is mostly or completely automated

Teams are approaching tool overload

Despite increased investment in many of the drivers of positive developer experience, one key indicator showed significant warning signs in our survey: the number of tools teams are using on a daily basis. Overall, 64% of respondents this year told us they want to consolidate their toolchain. Of those who told us they have begun to or want to consolidate, more than a quarter (27%) said that having too many tools negatively impacts developer experience due to too much context-switching from tool to tool.

Consistent with the large proportion of respondents who want to consolidate their toolchain, this year we observed a significant increase in the number of respondents who said they use 6-10, 11-14, and more than 15 tools compared to last year, and a corresponding decrease in the number of respondents who said they use 5 or fewer tools.

How many tools does your team use for software development?



Global trends

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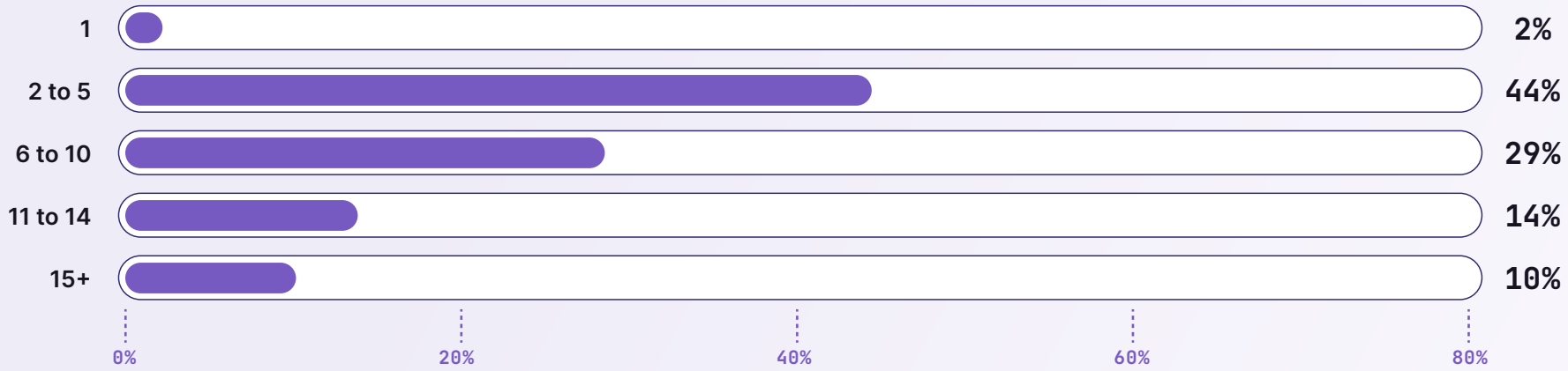

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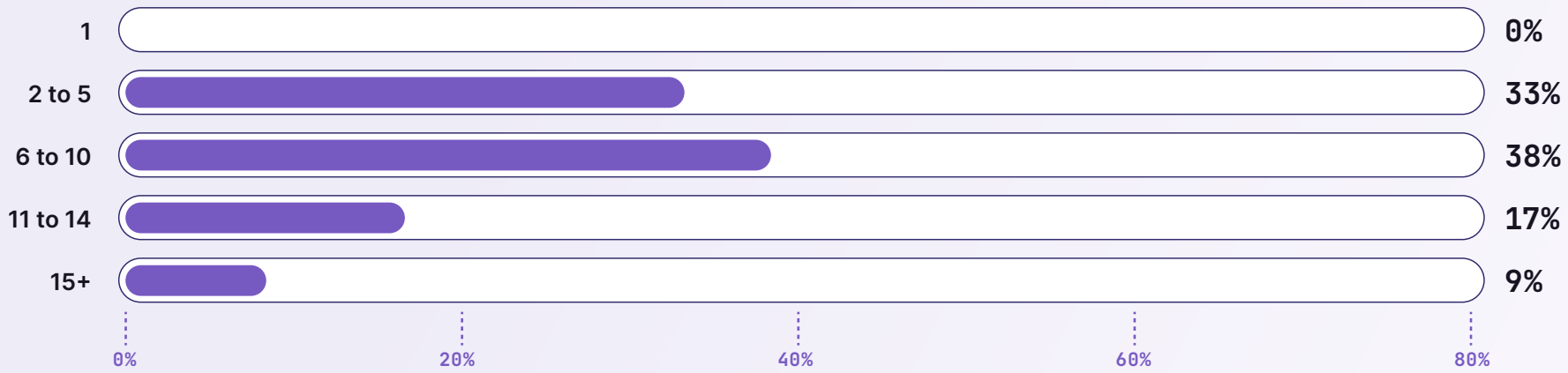

France has lighter toolchains — but still wants to consolidate

Although less than half (47%) of respondents in France said they use 6 or more tools — compared to 70% in Germany and 63% in both the U.S. and Canada — the majority of respondents in France (66%) still want to consolidate their toolchain.

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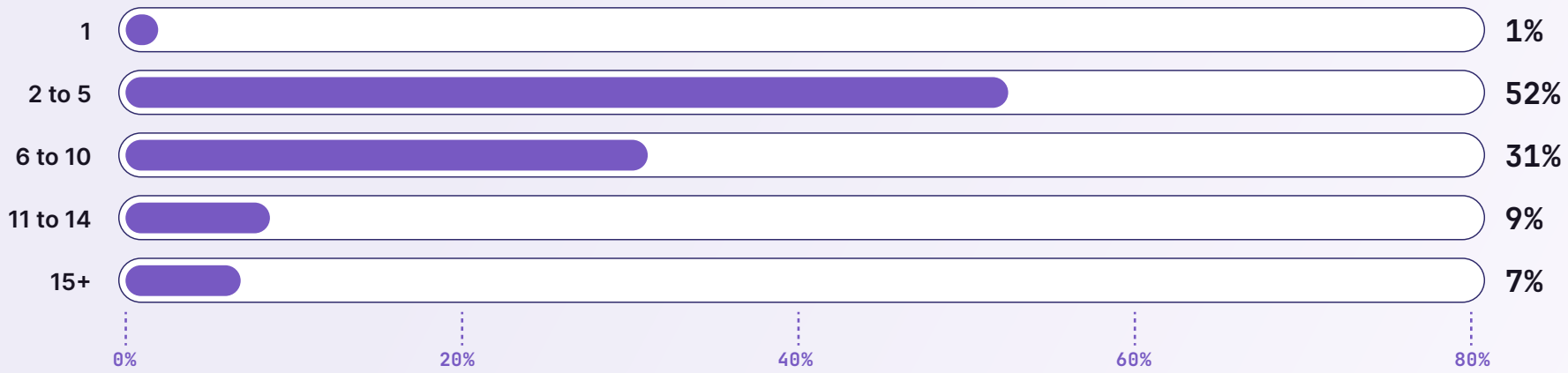

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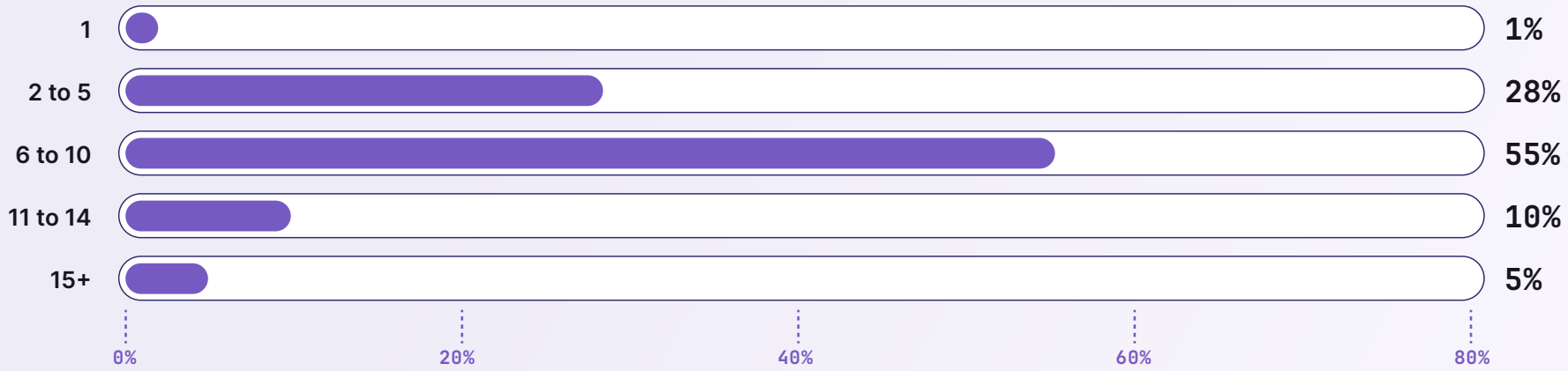

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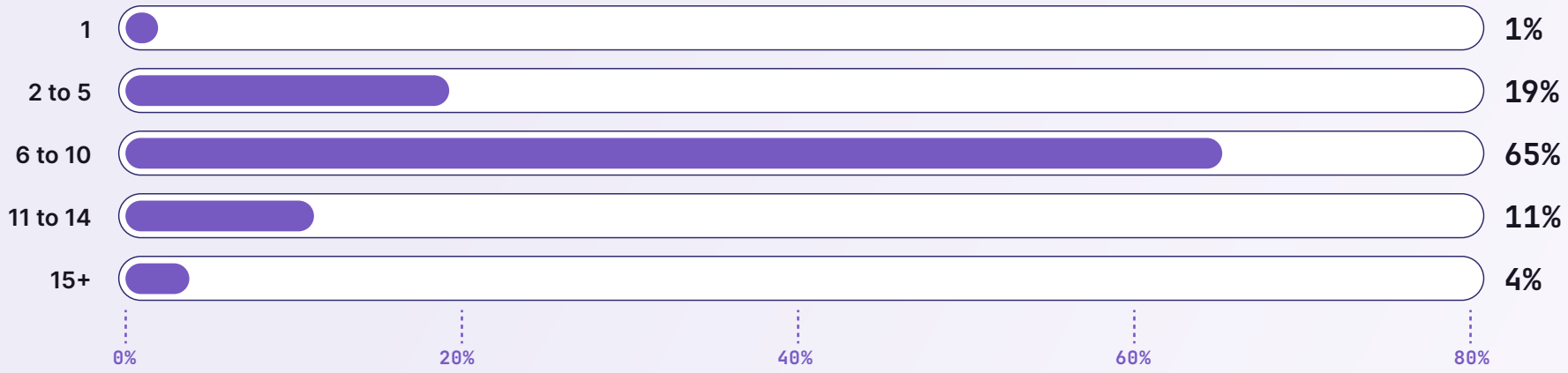

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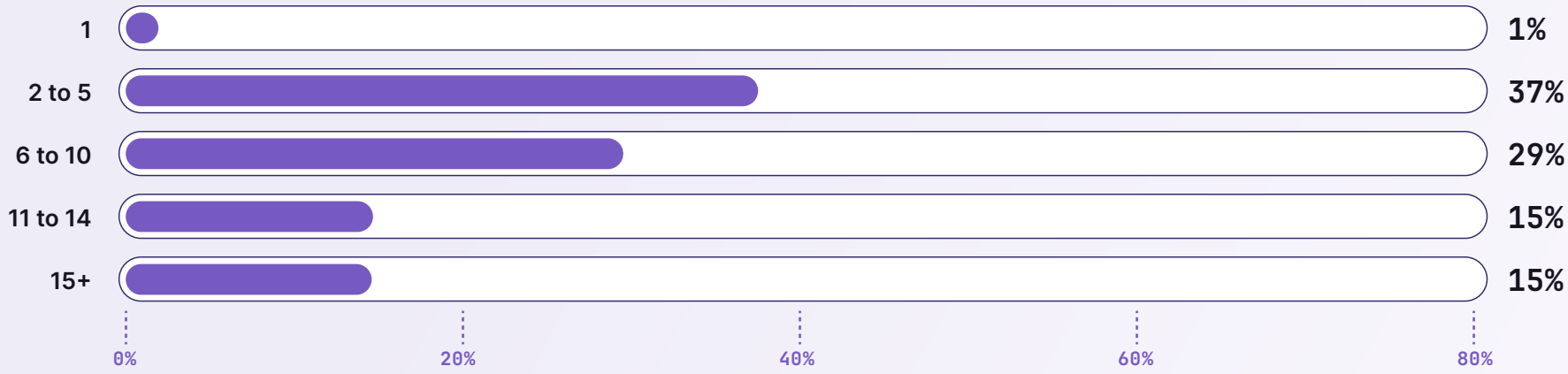

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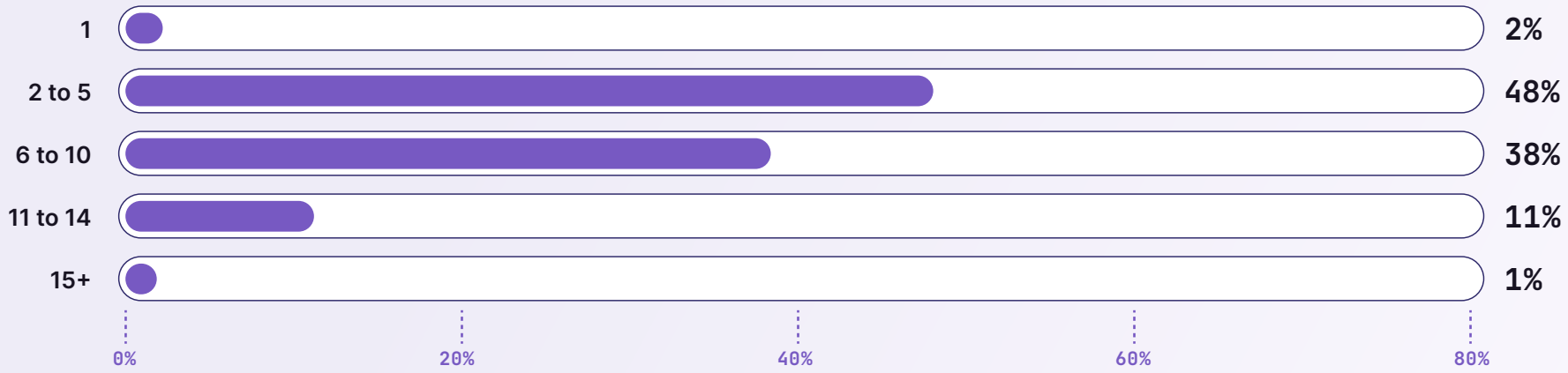

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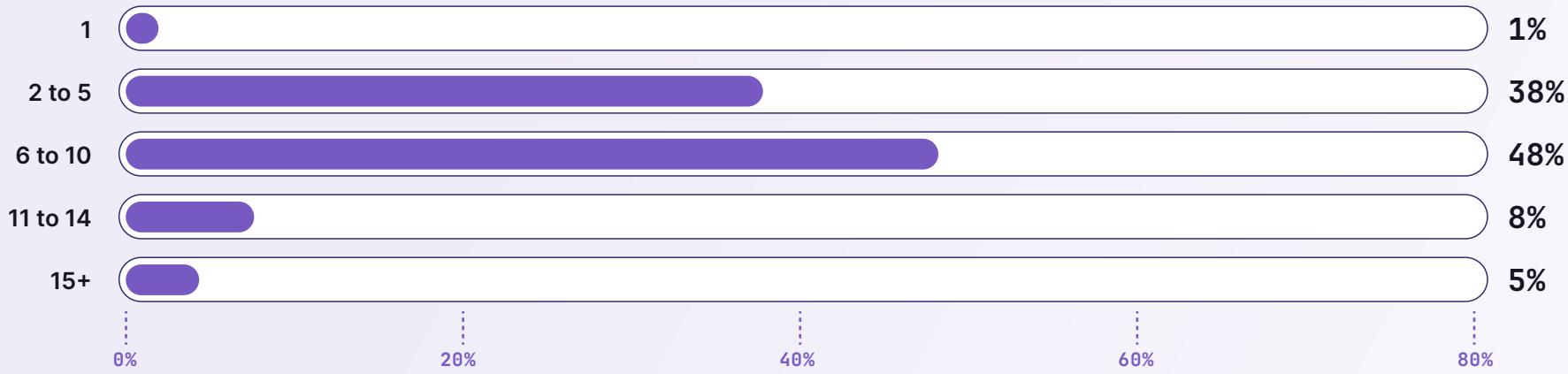

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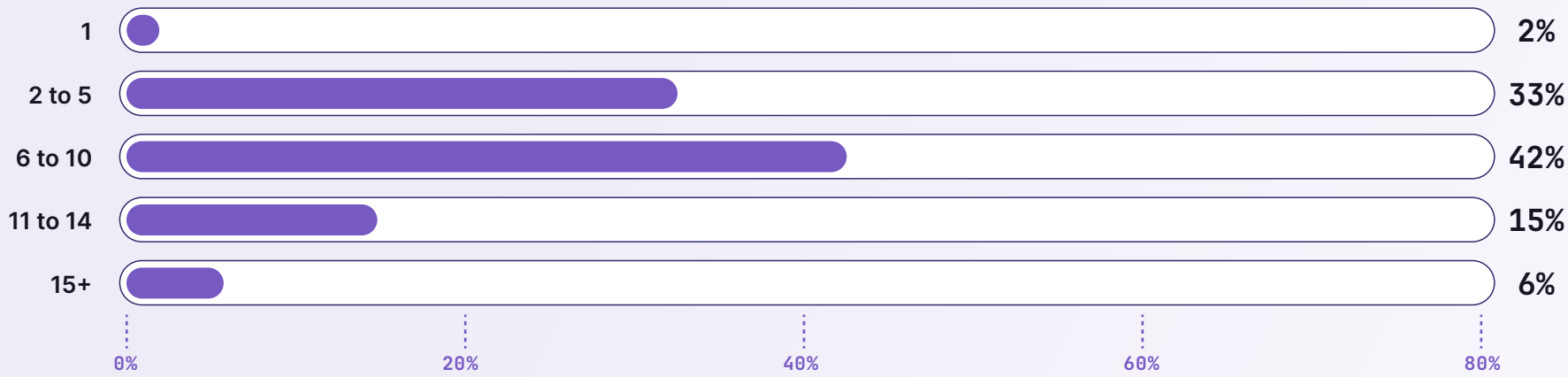

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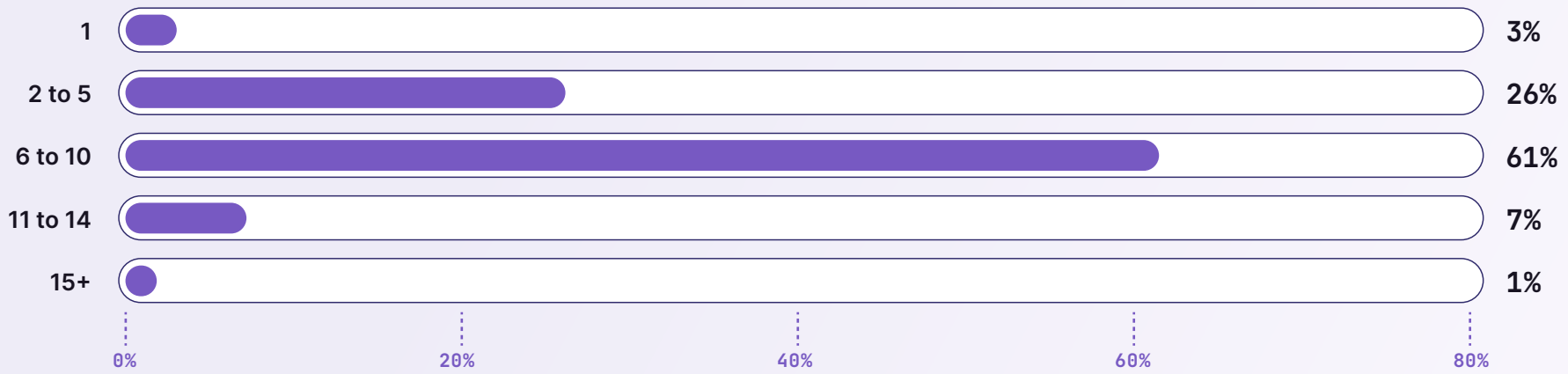

Tech is feeling the toolchain strain

Respondents at software, SaaS, and computer hardware organizations seemed to be feeling the strain the most, with a full quarter (25%) of respondents saying that they use 11 or more tools. The automotive industry, by comparison, had just 9% using 11 or more tools.

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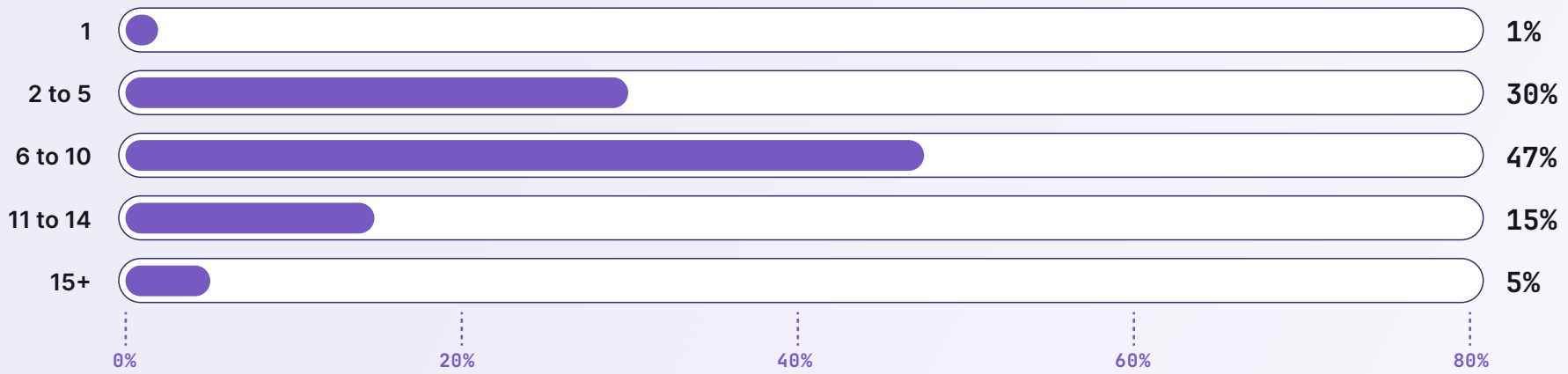

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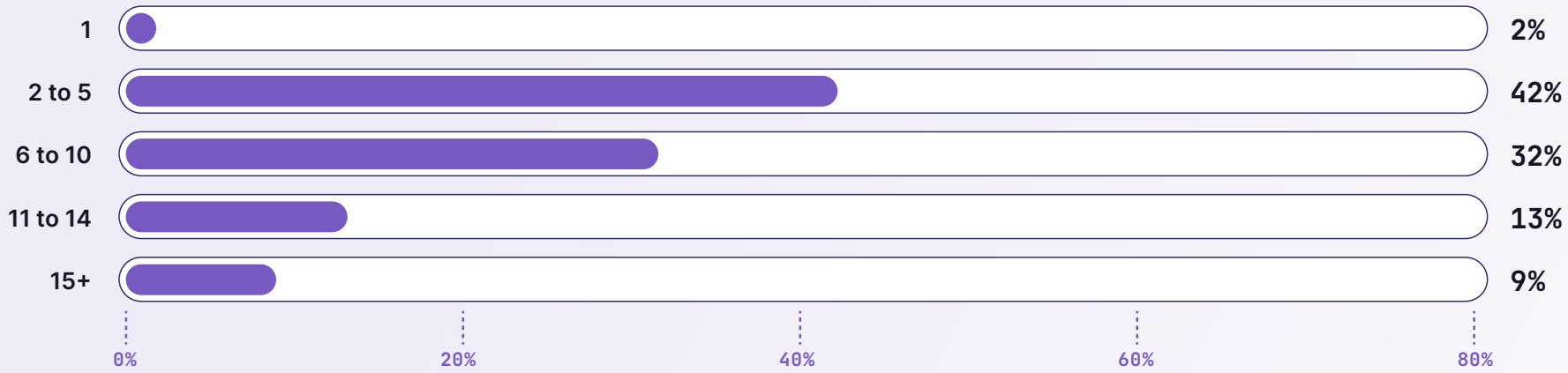

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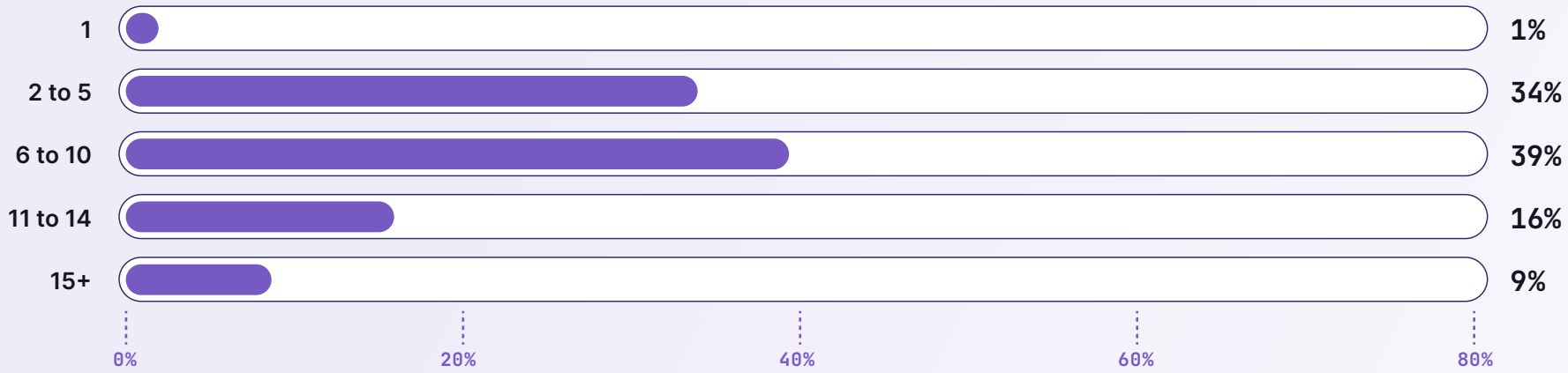

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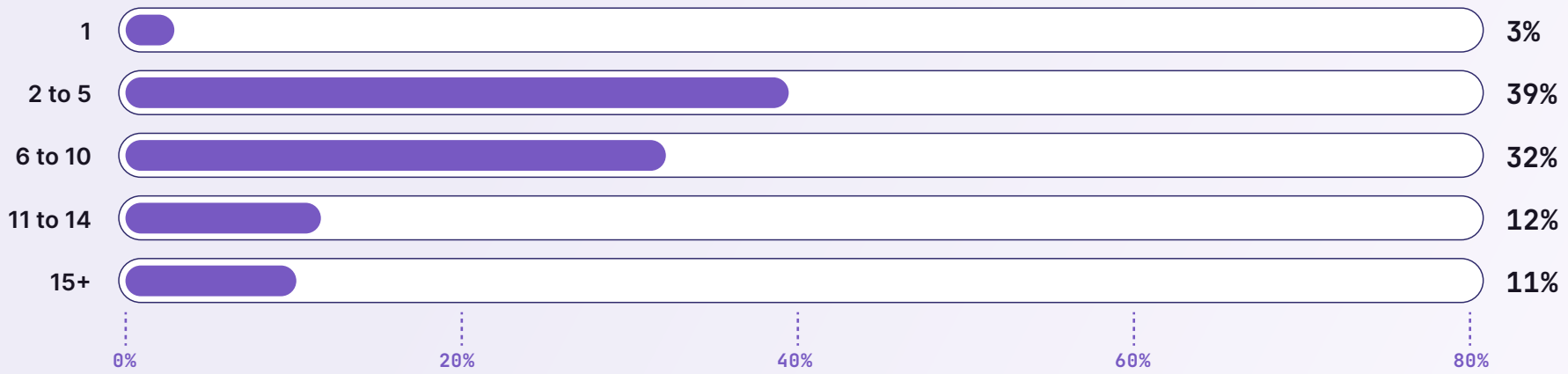
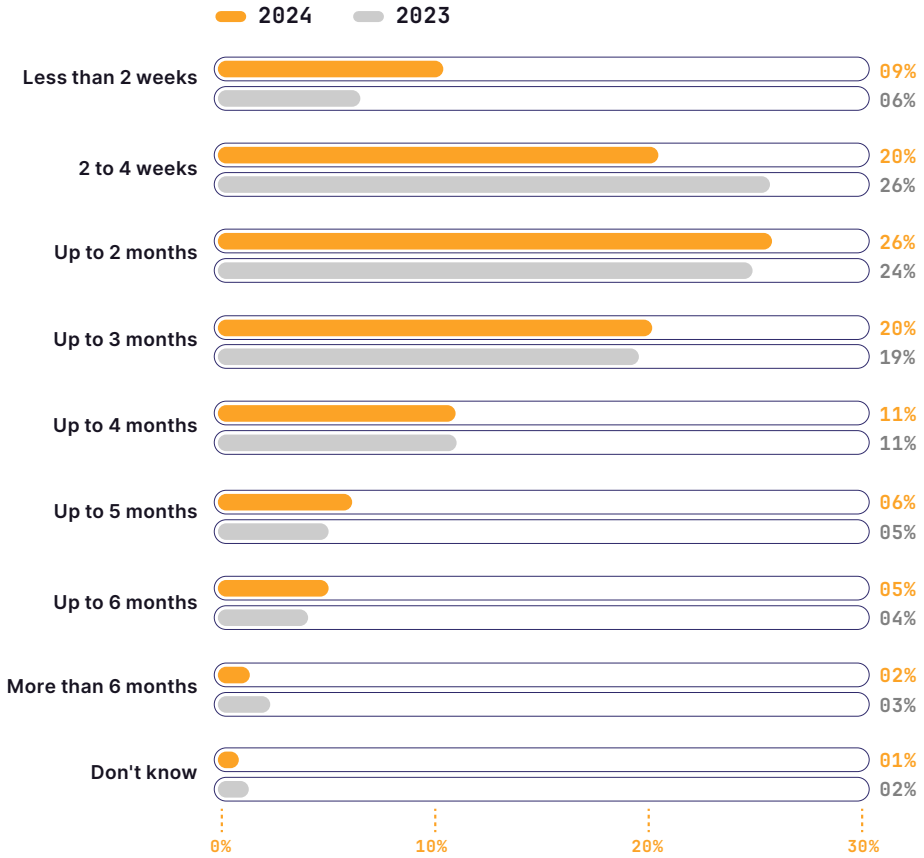


Onboarding is slowing developers down

Developer onboarding is another key indicator of developer experience that showed signs of decline in 2024 — perhaps in part because of the continued acceleration of tool sprawl.

This year, the number of respondents who said it takes between 1 and 2 months for developers to get onboarded and become productive increased significantly compared to last year, and fewer respondents said it takes a month or less.

How long does it take to onboard new developers in your organization?



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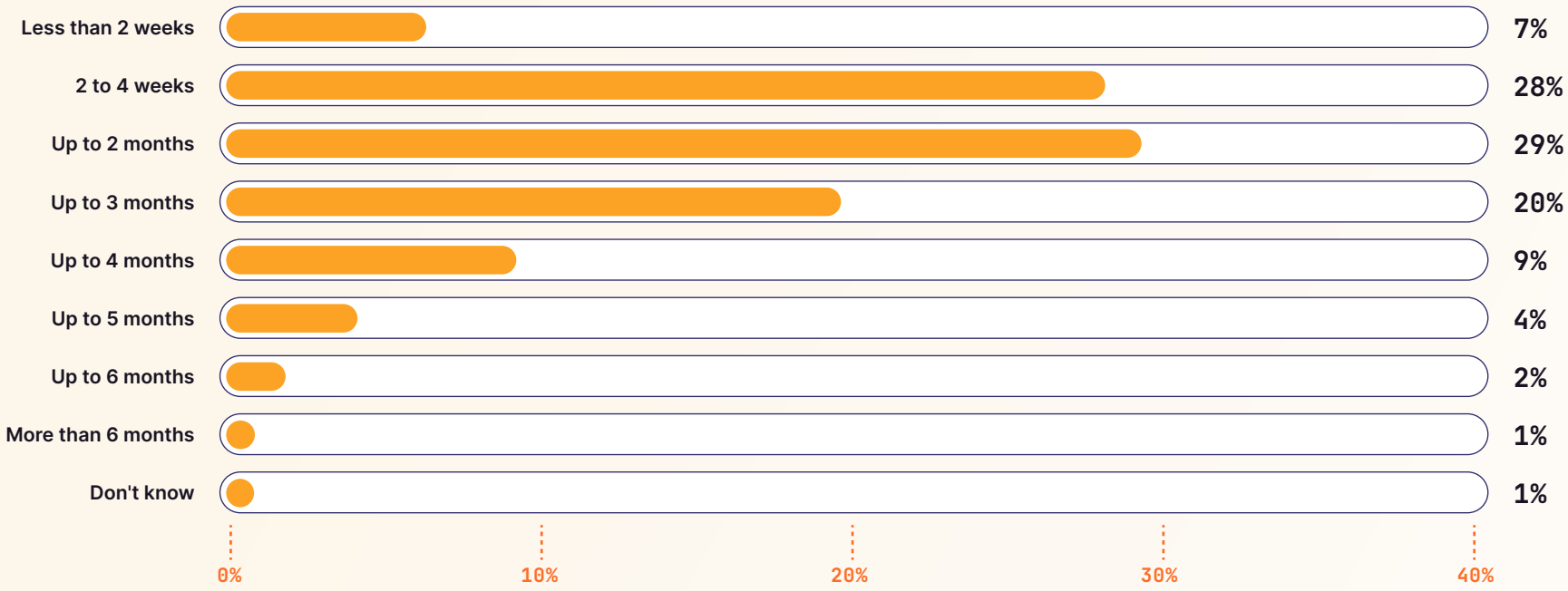

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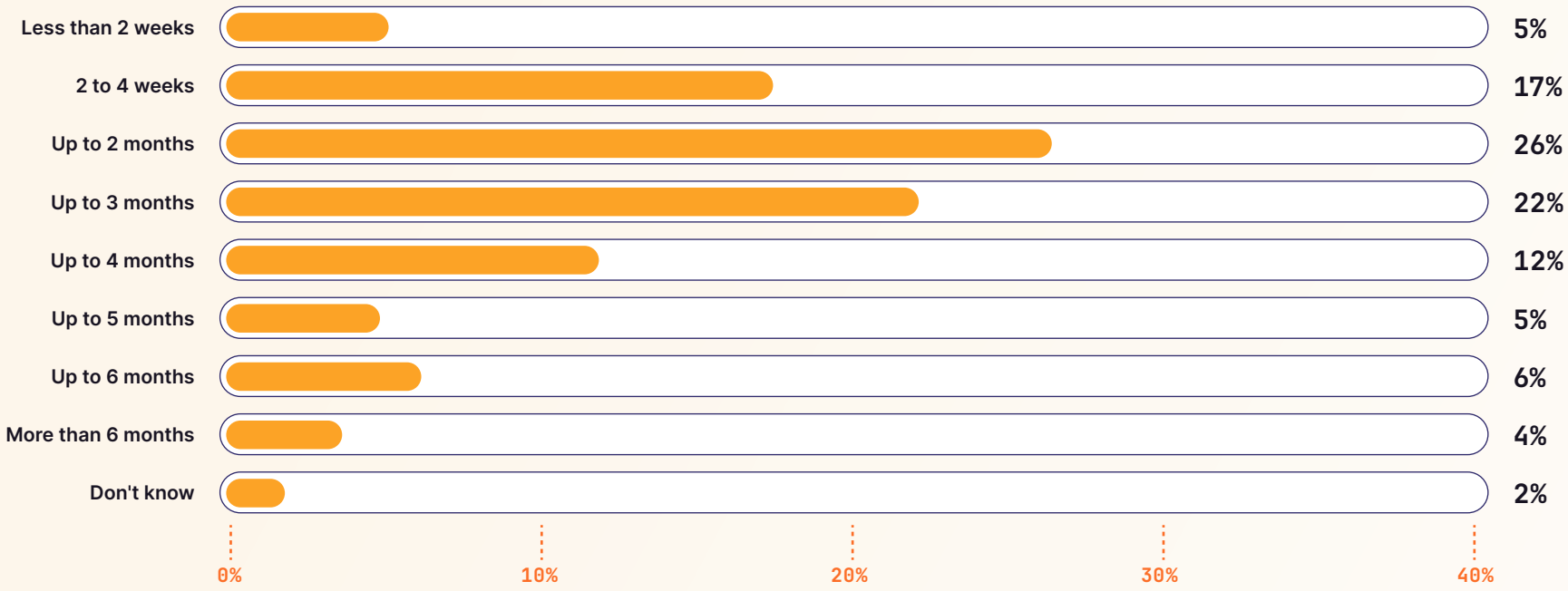

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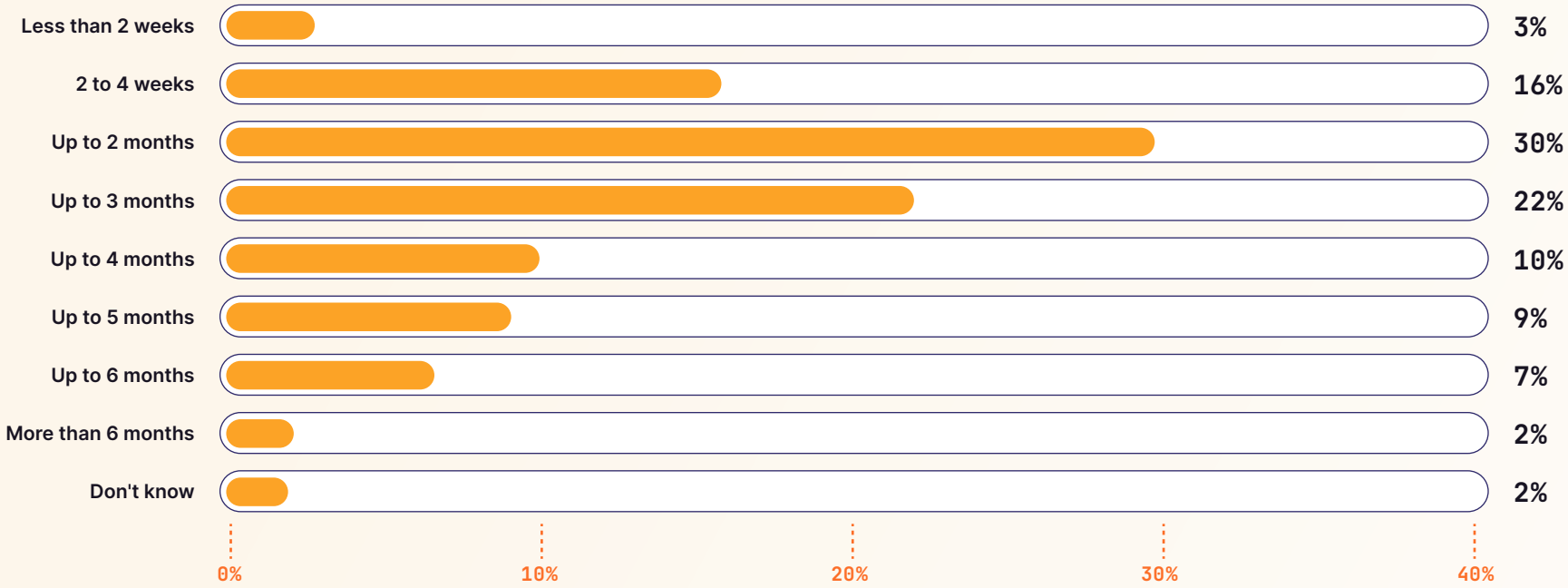

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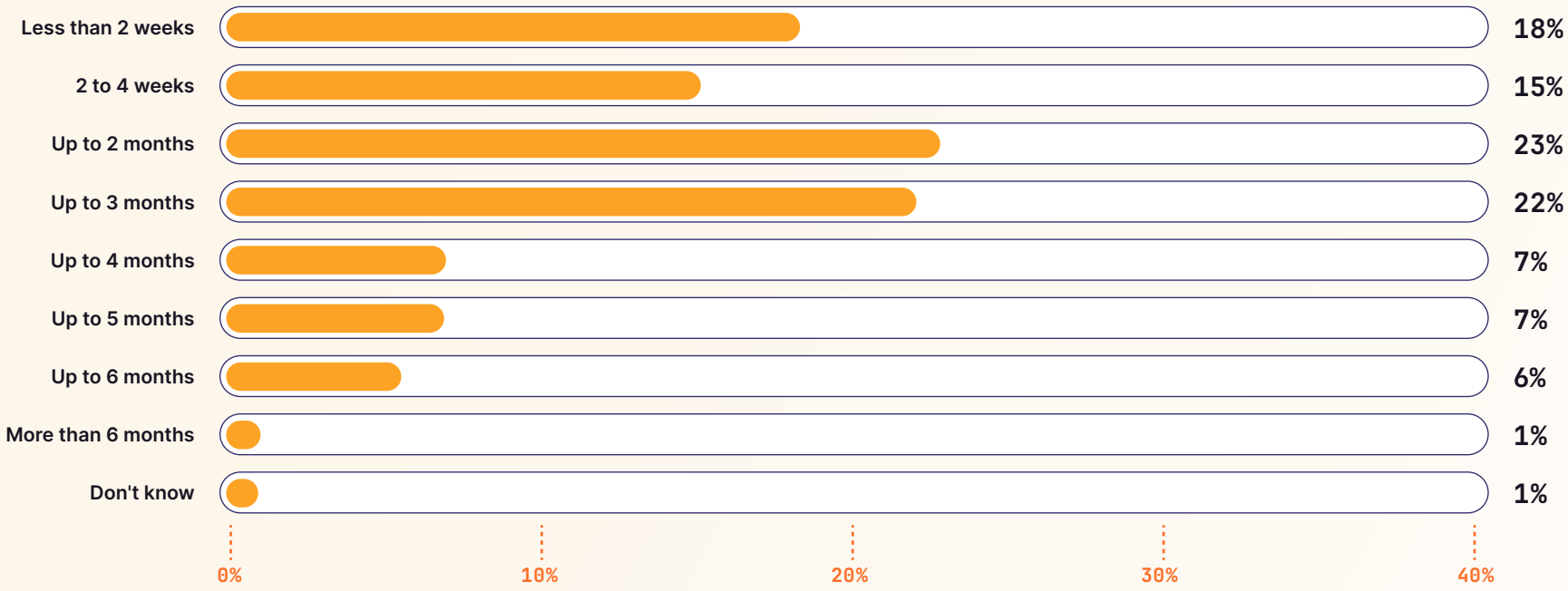

Are technology investments paying off in Germany?

Germany had higher rates of AI adoption (53%) and automation (74%) than other countries in our survey, and our findings suggest that these investments might be paying off in the form of developer onboarding. Of the countries included in the survey, Germany had the most respondents (18%) who said it takes less than 2 weeks to get developers onboarded.

Global trends

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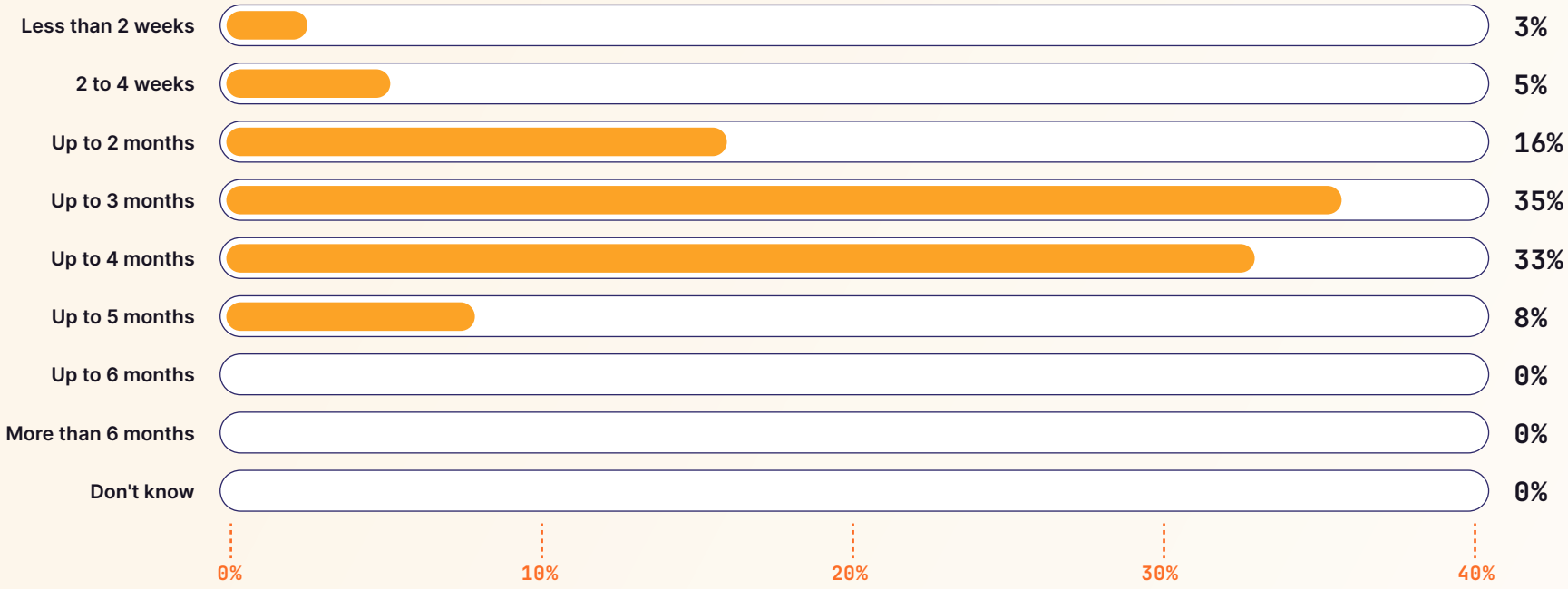

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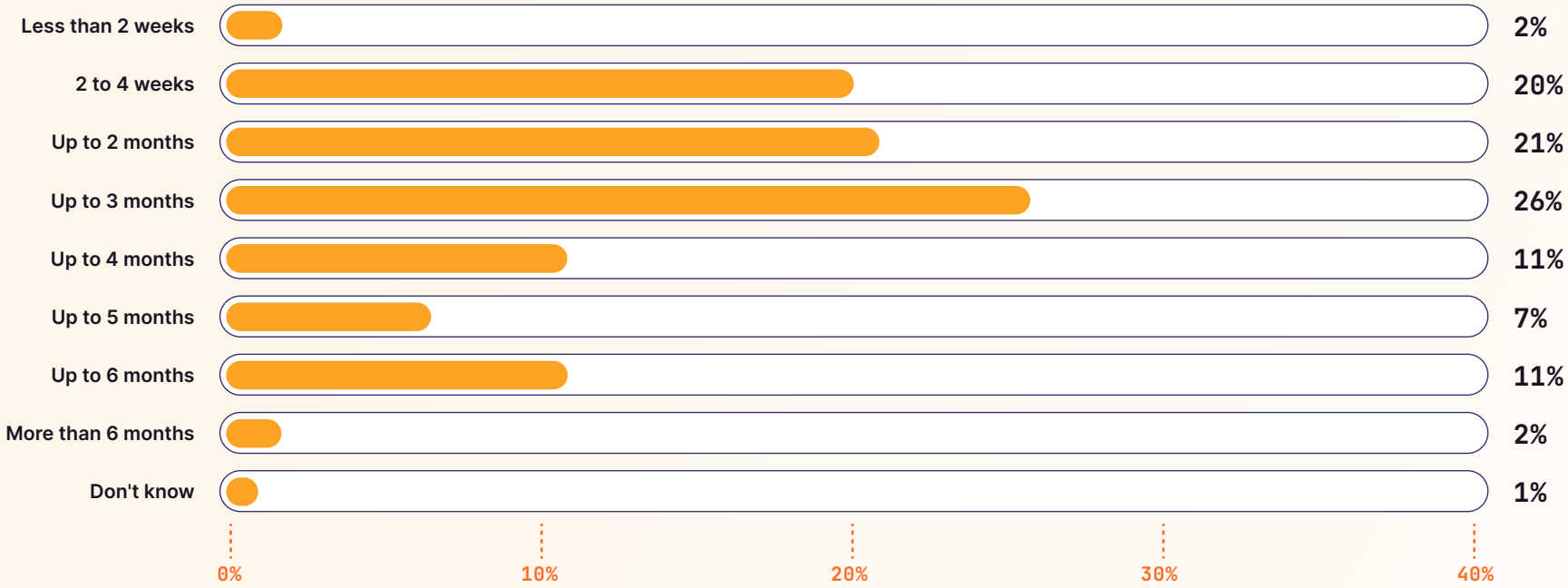

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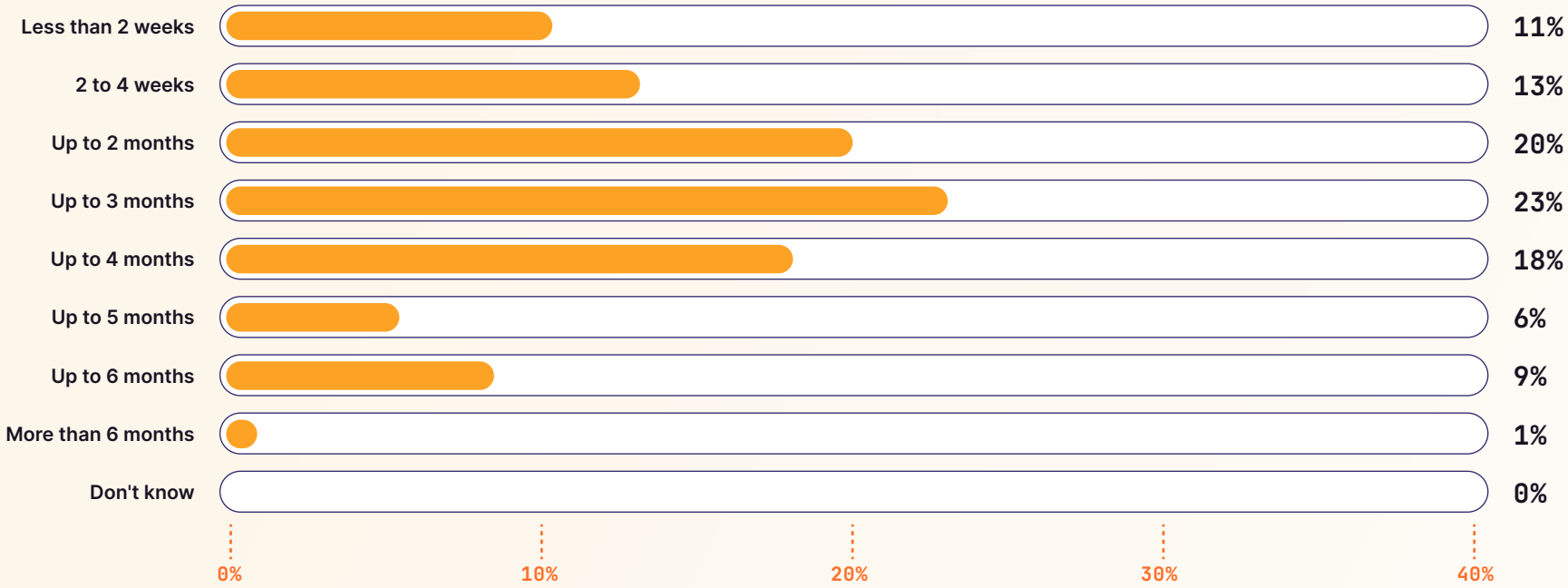

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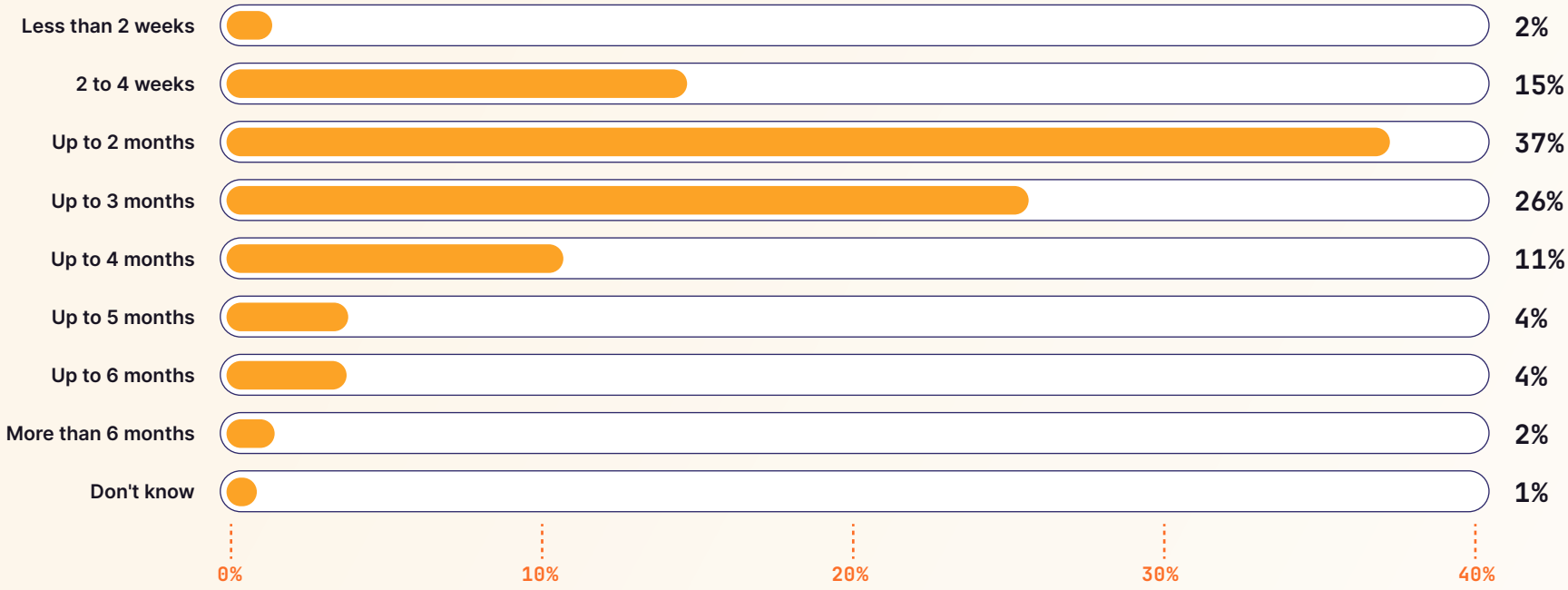

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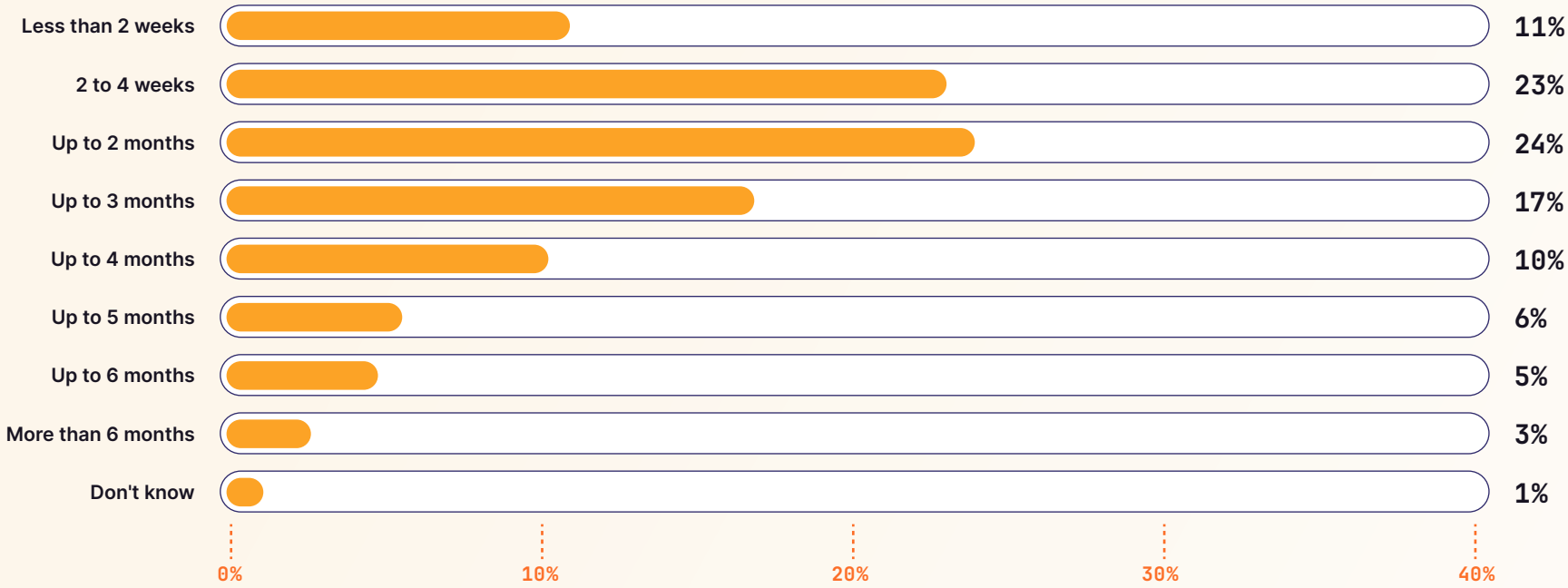

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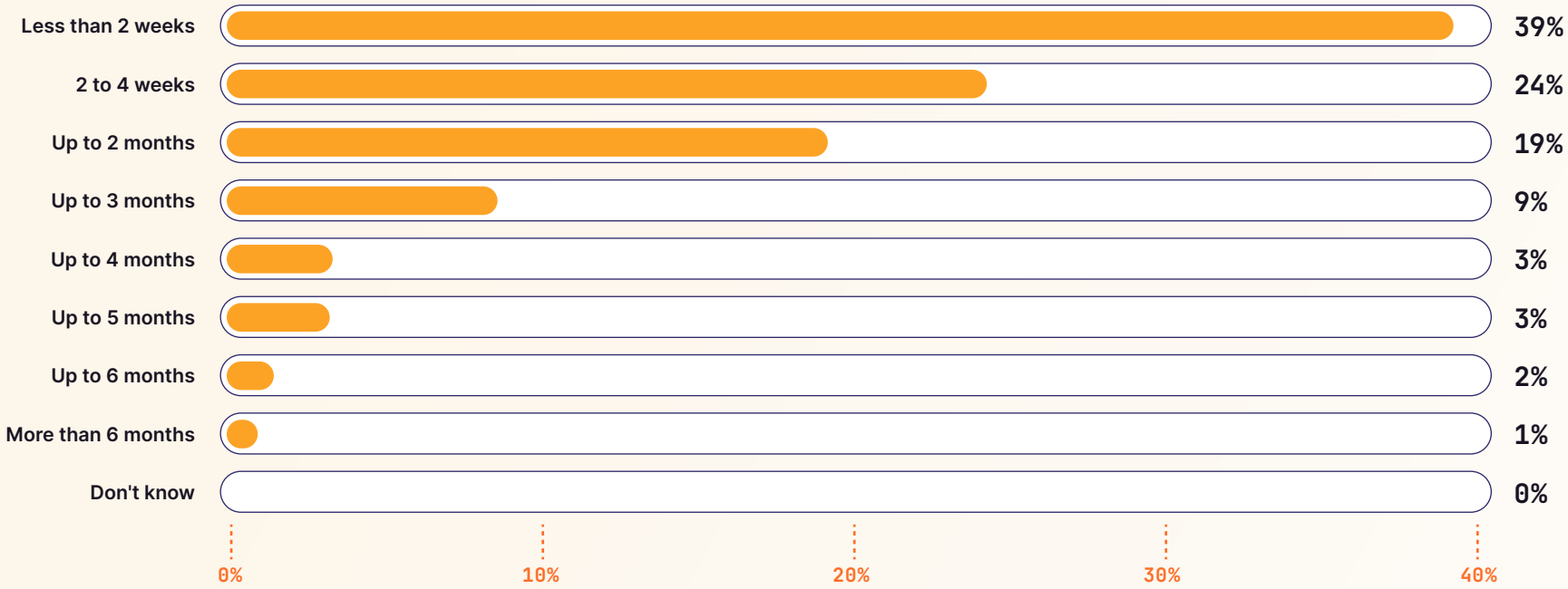

Tech and automotive organizations lead the pack

Software, SaaS, and computer hardware organizations and automotive organizations had comparatively shorter developer onboarding times, with just 16% and 9% of respondents, respectively, reporting developer onboarding times of more than 3 months. More than a third (39%) of automotive respondents reported developer onboarding times of less than 2 weeks.

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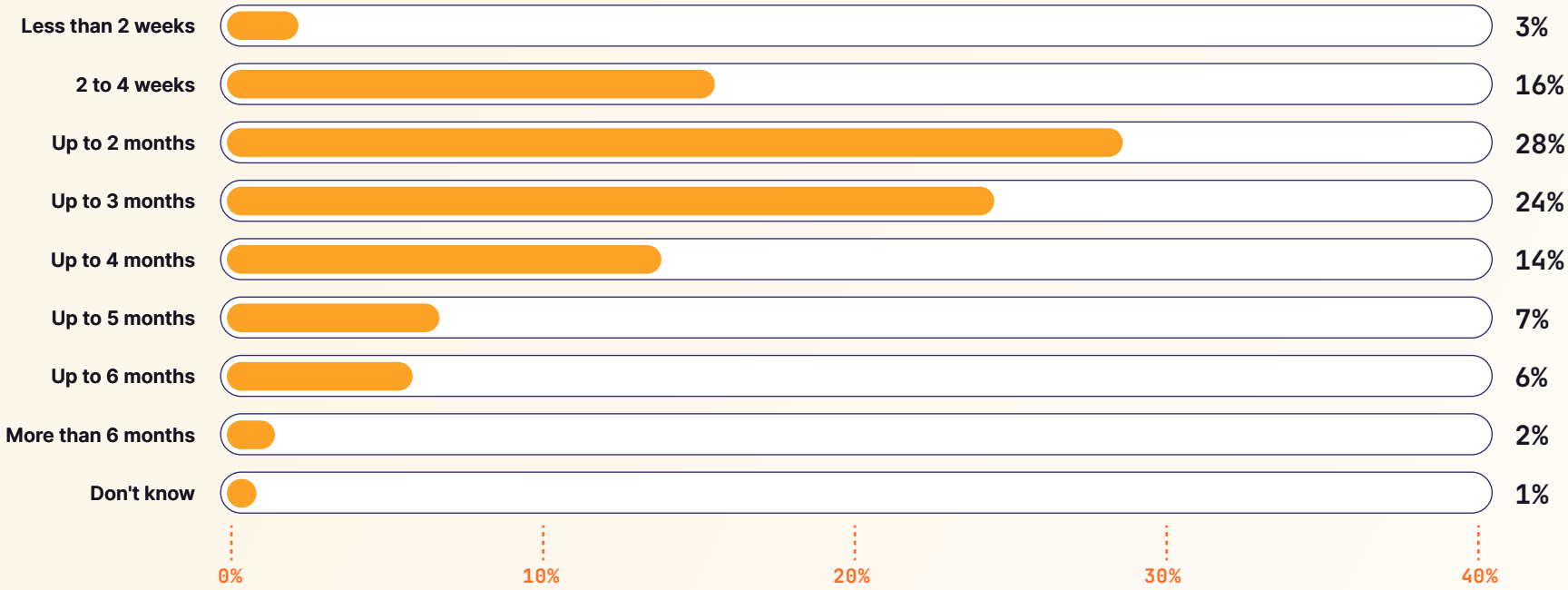

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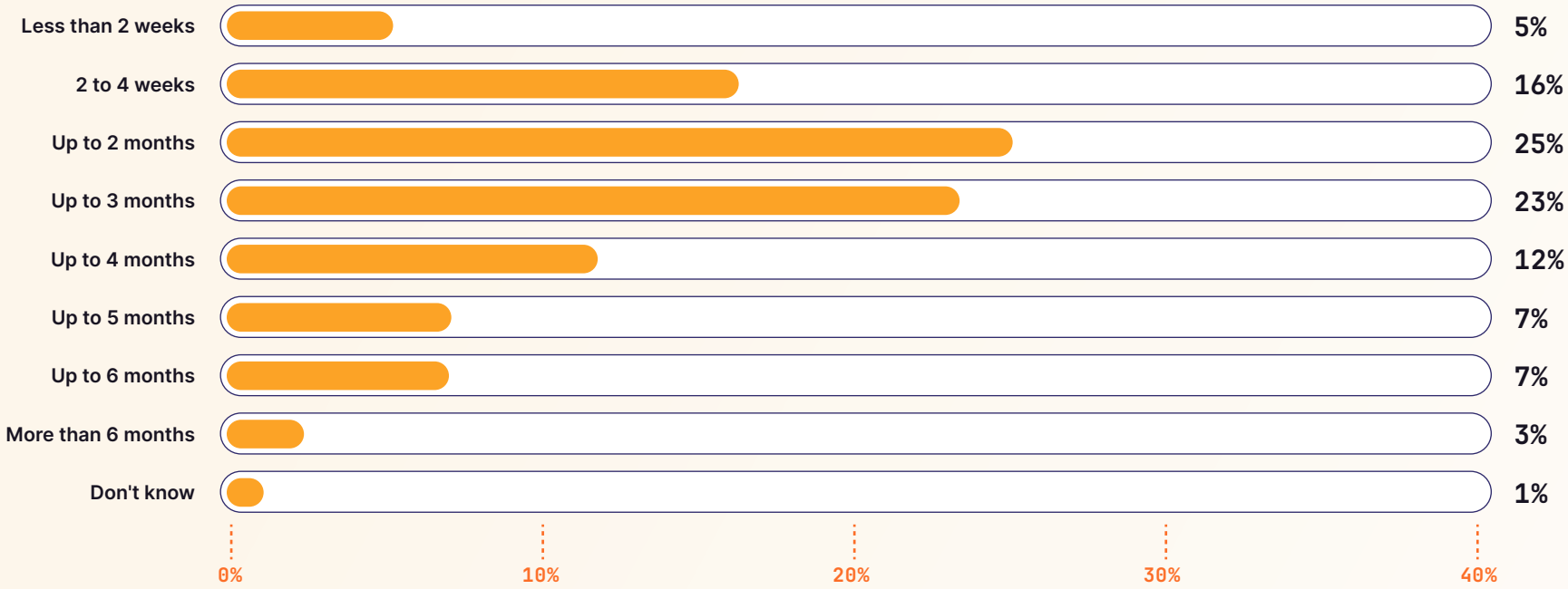

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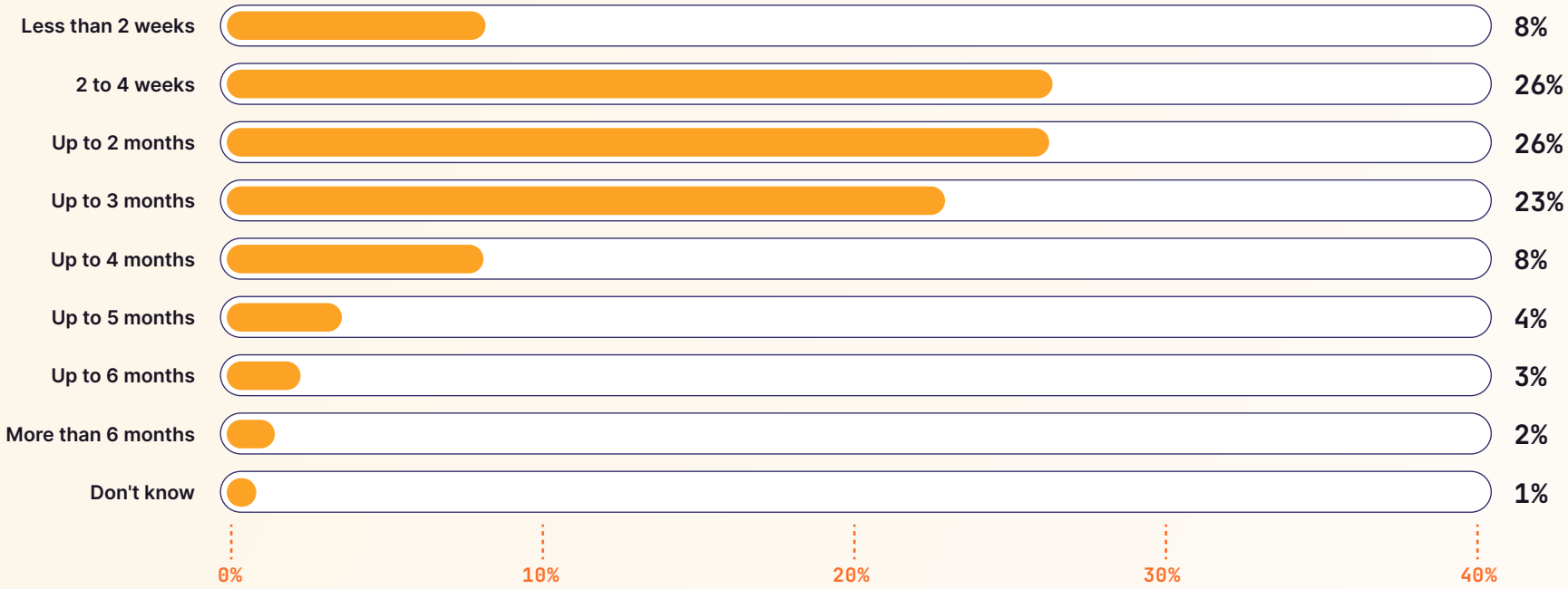

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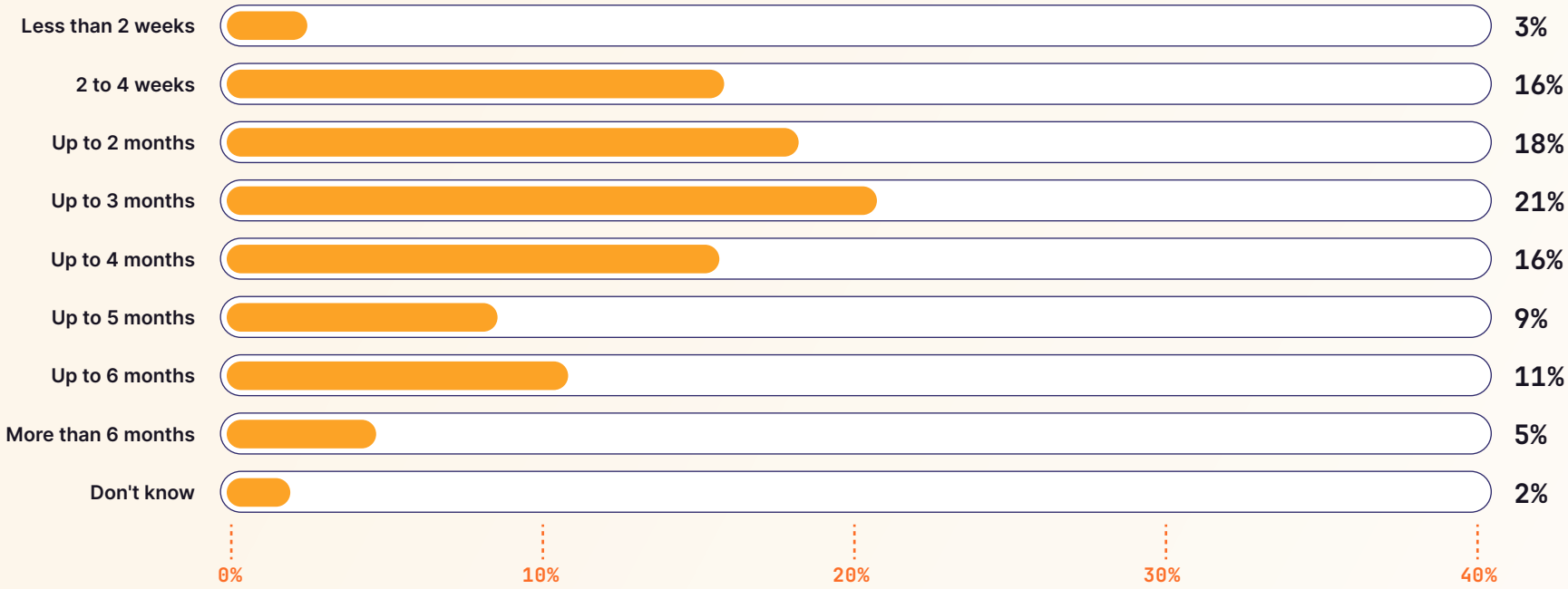
How long does it take to onboard new developers in your organization?

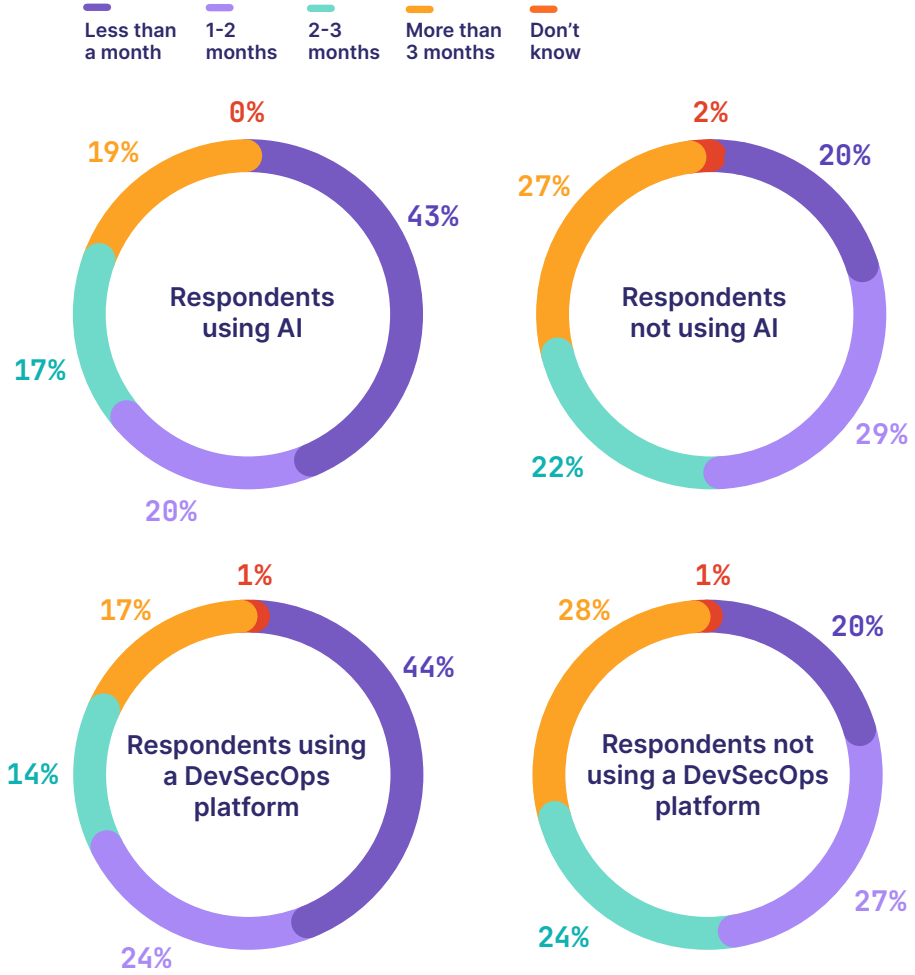
Automotive	Financial services	Public sector	Software/SaaS/ Computer hardware	Telecommunications



AI and DevSecOps platform usage speed up developer onboarding

This year, we observed both AI usage and a DevSecOps platform to have a significant positive effect on developer onboarding. Respondents who said they are currently using AI for software development (43%) were much more likely than those not using AI (20%) to say that developer onboarding typically takes less than a month. The same effect was observed for DevSecOps platform usage, with 44% of those currently using a platform saying that developer onboarding takes less than a month, compared to 20% of those not using a platform.

How long does it take to onboard new developers in your organization?



Executives acknowledge the importance of developer productivity, but measurement is difficult

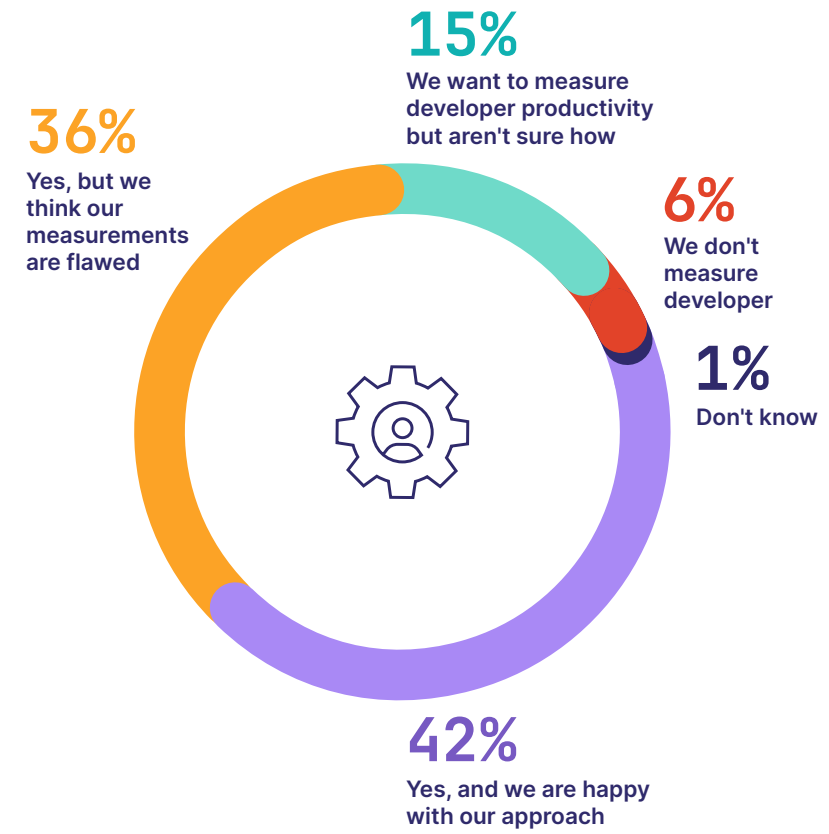
When organizations remove obstacles so developers can onboard quickly and start creating value right away, one of the primary — and most measurable — outcomes is developer productivity.

In our survey, over half (55%) of C-level executives agreed that developer productivity is important to the success of their organizations, and 57% of C-level executives agreed that measuring developer productivity is key to business growth.

However, only 42% of C-level executives currently measure developer productivity within their organization and are happy with their approach. Over a third (36%) feel their methods for measuring developer productivity are flawed, while 15% want to measure developer productivity but aren't sure how.

Leveraging a DevSecOps platform provides a foundation for measuring developer productivity by bringing metrics from all stages of the development process into a single data store. In our survey, C-level respondents whose organizations are using a platform (56%) were much more likely than those not using a platform (33%) to be happy with their current approach to measuring developer productivity.

Do you currently measure developer productivity within your organization?



Security responsibilities are shifting, but challenges remain

Security continues to be a top priority for organizations, and this year's survey highlighted a number of ways investments in security are paying off. However, the survey respondents also flagged several areas where shifts in mindset haven't quite translated into shifts in practice, as well as gaps that organizations should prioritize as they seek to more deeply embed security into software development workflows.

The reality of shared security responsibility sets in

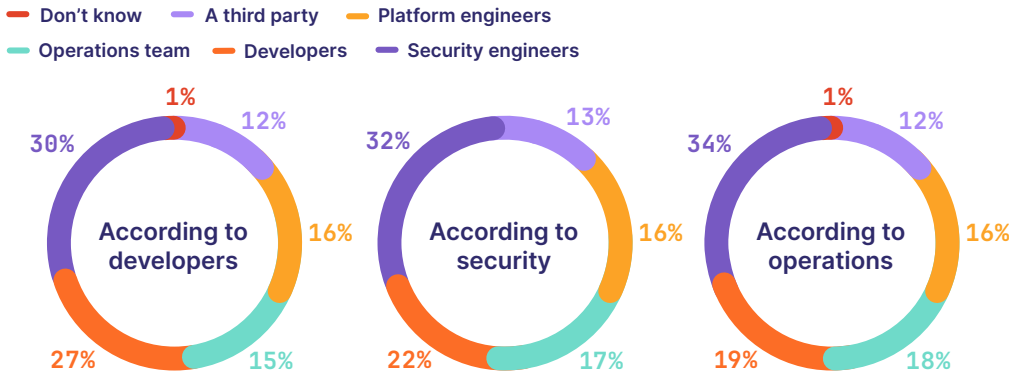
This year, developers were significantly more likely than security respondents to say that developers are responsible for security. This is different from the trend observed in 2023, where developers were more likely than security respondents to say security is primarily responsible.

In addition, a quarter (25%) of all respondents strongly agreed that they are primarily responsible for application security, and another 33% agreed, indicating that over half (58%) of all respondents feel some degree of responsibility for application security. In other words, security is not just the responsibility of the security team.

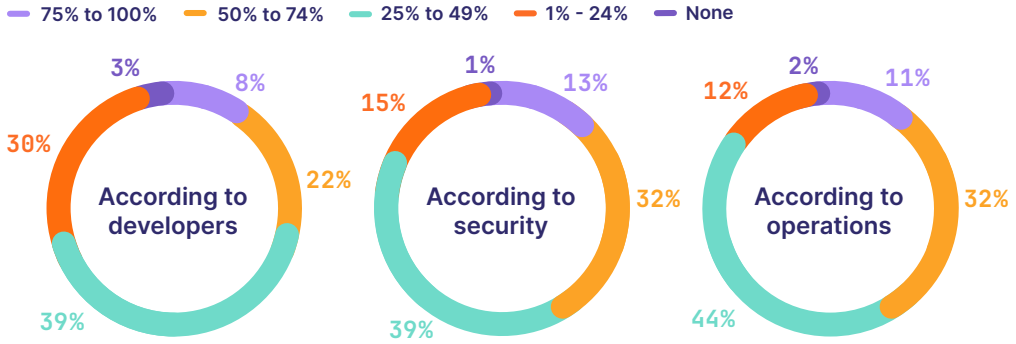
Despite the move to a more collaborative attitude towards security, however, security teams themselves still voiced several concerns in our survey. Over half (58%) of security respondents said they have a difficult time getting development to prioritize remediation of vulnerabilities, up from 42% last year, and 55% of security respondents said security vulnerabilities are mostly discovered by the security team after code is merged into a test environment, up from 46% last year.

Security and operations teams were also more likely to experience frustration with toolchains: 86% of operations respondents and 84% of security respondents told us they spend a quarter or more of their time on toolchain maintenance and integration, compared to 68% of developers.

Who is primarily responsible for application security at your organization?



How much of your responsibilities involve maintaining and/or integrating your DevOps toolchain?

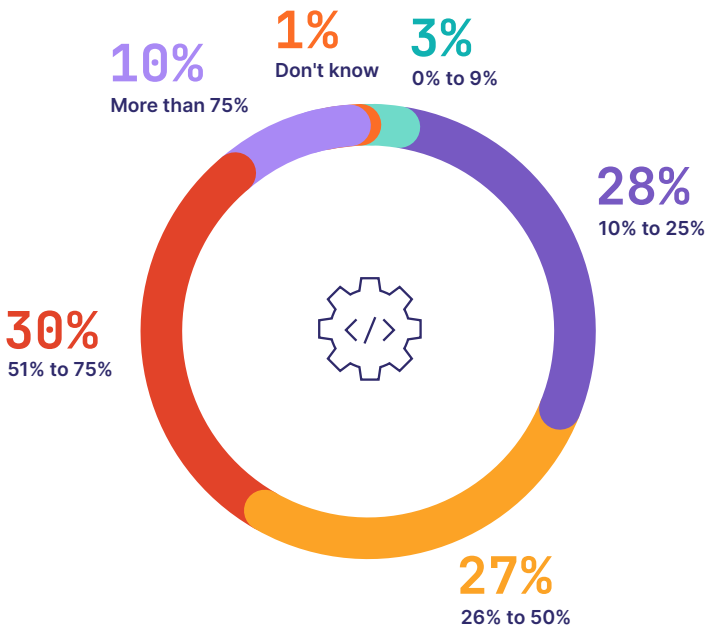


Software supply chain security is a potential weak spot

Overall, 67% of developers told us that a quarter or more of the code they work on is from open source libraries. This was even higher in software, SaaS, and computer hardware organizations, at 85% of developers, as well as in the Asia-Pacific region (76%).

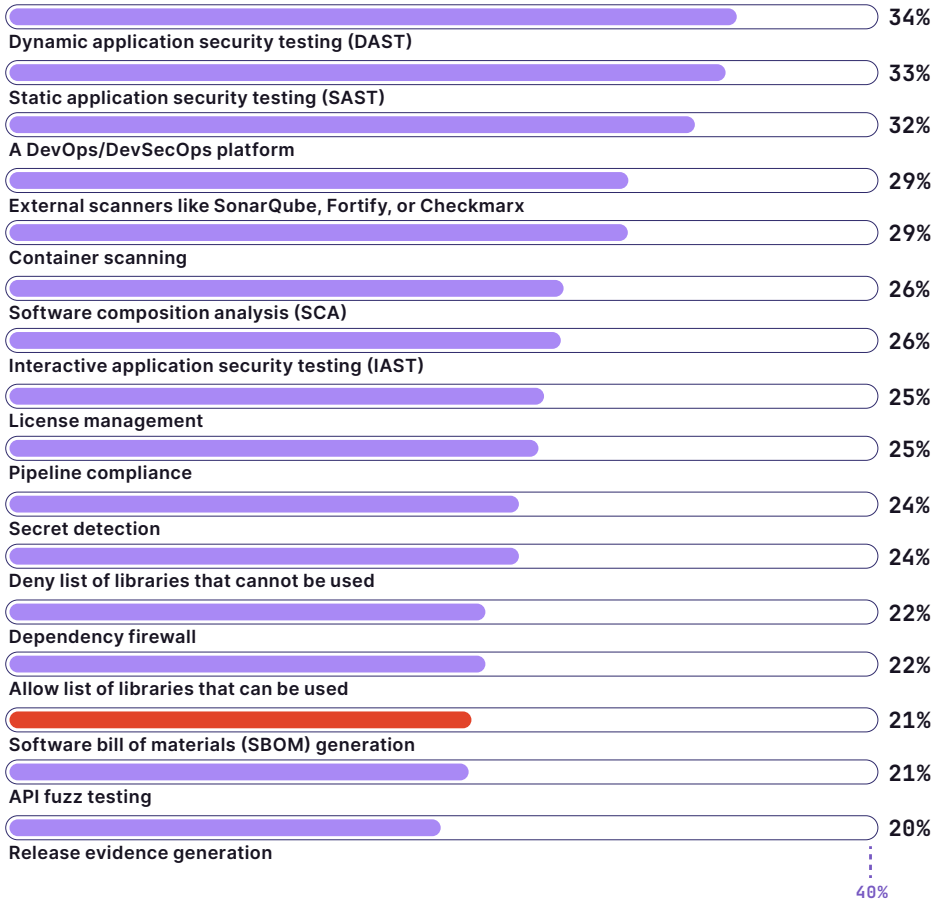
Capabilities like a software bill of materials (SBOM) — a list of all the components, libraries, and modules that make up an application — are essential for maintaining the security of the software supply chain, especially as the amount of code pulled from open source libraries increases. However, in our survey, only 21% of respondents said their organizations are currently using SBOMs to enable security in the software development lifecycle. This was particularly low in the Asia-Pacific region, at just 15%.

Percentage of code from OSS libraries, according to developers



Organizations face a growing imperative to be aware of the makeup of the software that they are producing. Organizations should consider using tools like SBOMs in tandem with other capabilities of a DevSecOps platform, such as software composition analysis, to prevent software supply chain security breaches, and to ensure insecure open source components aren't creating additional work for security teams.

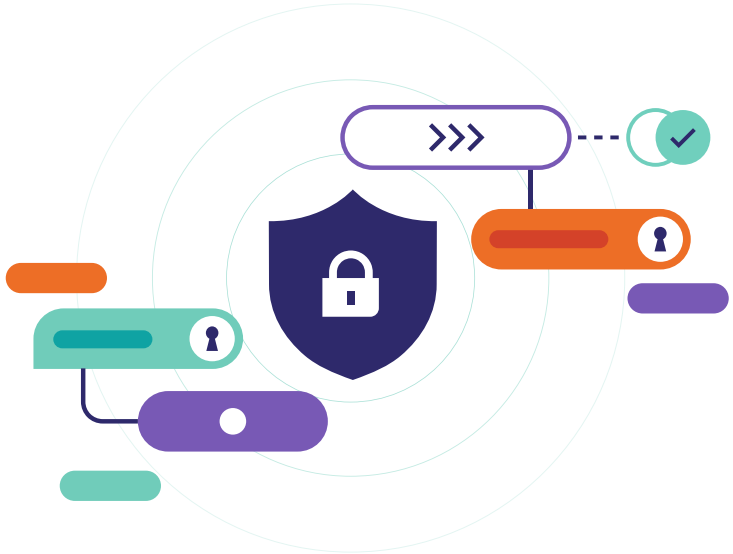
How does your organization enable security in the software development lifecycle?



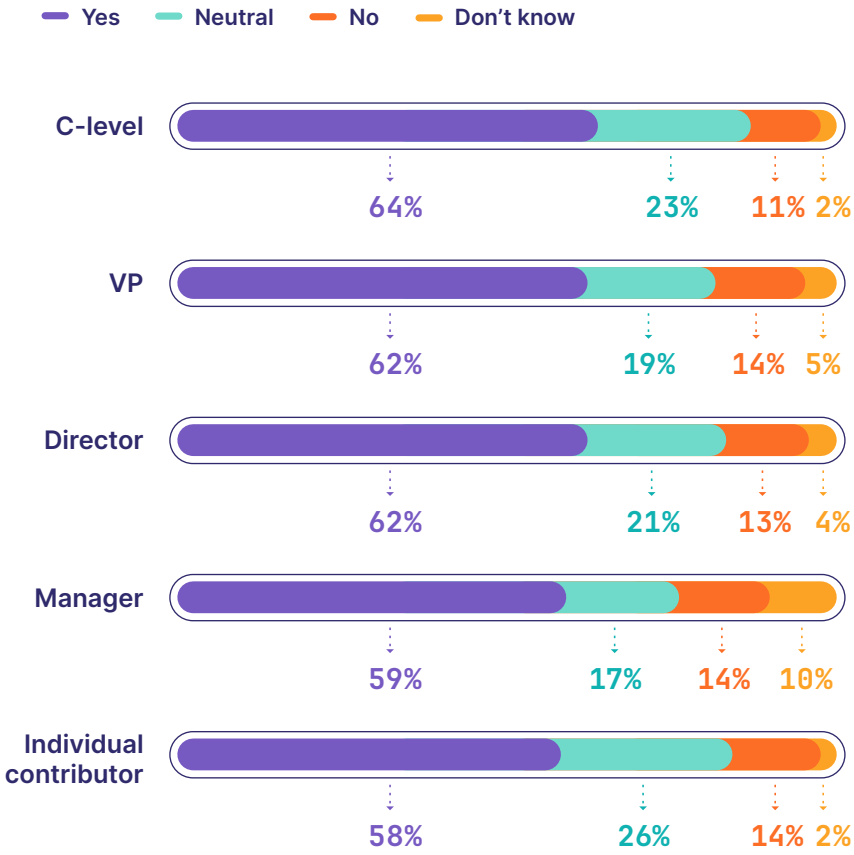
Bridging the security perception gap

Our survey findings highlighted that C-level executives appear to be optimistic about DevSecOps and the security benefits it's bringing to their organizations — but, as we observed with AI, leaders should ensure that they keep a pulse on how tools and methodologies are being implemented by their teams in practice.

Security is clearly top of mind for the C-suite, and leaders are seeing positive results from their investments in DevSecOps. C-level executives identified more secure applications as the top benefit of DevOps and DevSecOps, followed by faster iteration and better code quality. C-level respondents at organizations that are currently using a DevSecOps platform also pointed to security as the number two benefit of adopting a platform, after improved operational efficiency.



Are you confident in your organization's approach to application security?



However, discrepancies in attitudes between leaders and individual contributors could suggest that leaders are unaware of some of the security challenges teams are facing. Over 60% of C-level executives told us they feel DevSecOps practices are well-ingrained in their organization, but significantly fewer individual contributors (52%) felt the same way. Similarly, C-level executives (64%) were significantly more likely than managers (59%) and individual contributors (58%) to say they are confident in their organization's approach to application security.

What's causing the disconnect? Security teams themselves pointed to frustrations with organizational processes that could be negatively impacting security practices. Over half (52%) of security respondents said their efforts to quickly fix vulnerabilities are often slowed by red tape at their organization, up from 43% in 2023.

The perception gap between leaders and individual contributors could potentially prevent organizations from fully realizing the benefits of DevSecOps. Our survey suggests that investing in tools that foster collaboration and cut through red tape, like a DevSecOps platform, is one way to close the gap: Respondents who are using a platform (68%) were more likely than those not using a platform (56%) to be confident in their organization's approach to application security.

Top benefits of DevOps/DevSecOps, according to C-level executives

34%

More secure applications

33%

Faster iteration

26%

Better code quality

26%

Greater developer productivity

26%

Improved time to market

26%

Happier team members

Demographics and methodology

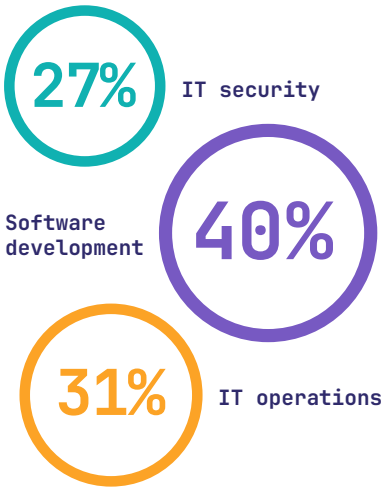
We collected a total of 5,315 survey responses in April 2024 from individual contributors and leaders in development, IT operations, and security across a mix of industries and business sizes worldwide.

We used two sampling methods for the data collection:

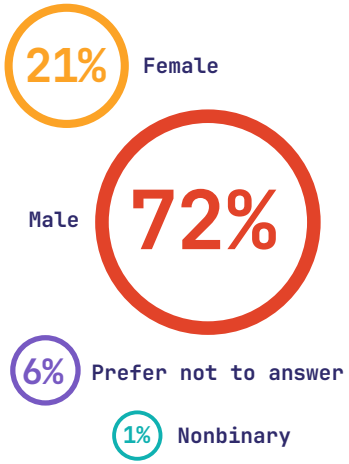
- We distributed the survey via GitLab's social media channels and email lists.
- A third-party research partner conducted panel sampling, which reduces bias in the sample. Our research partner used its proprietary access to lists, panels, and databases to gather quality responses and cleaned the data throughout fielding to ensure data quality.

Here's a closer look at the survey respondents:

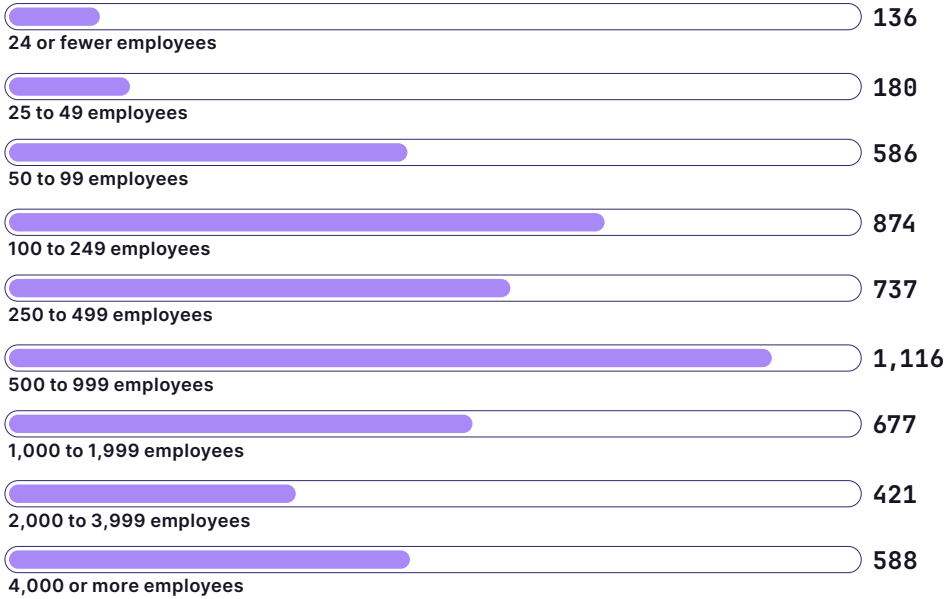
Functional area



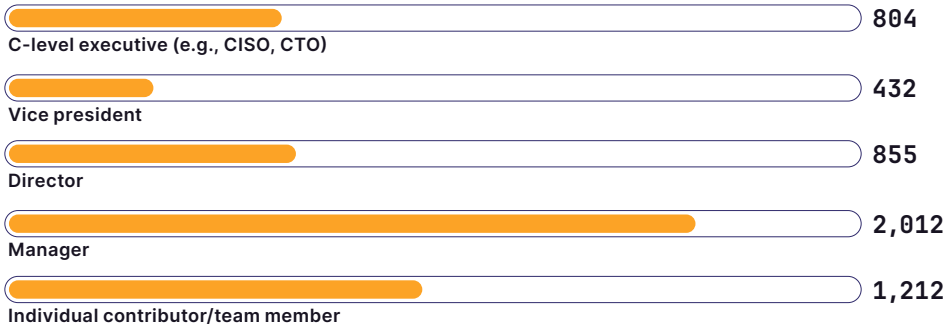
Gender



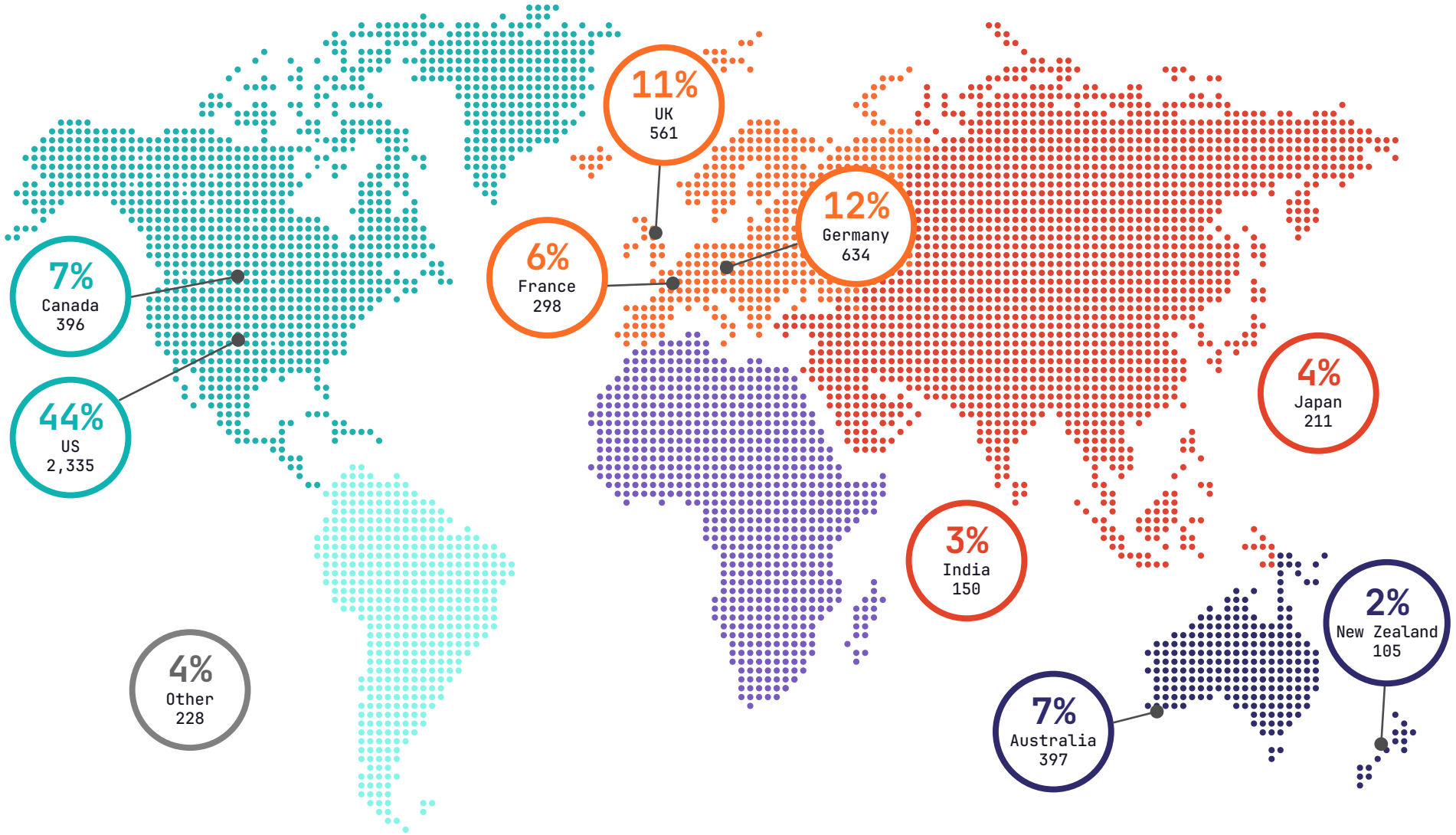
Organization size



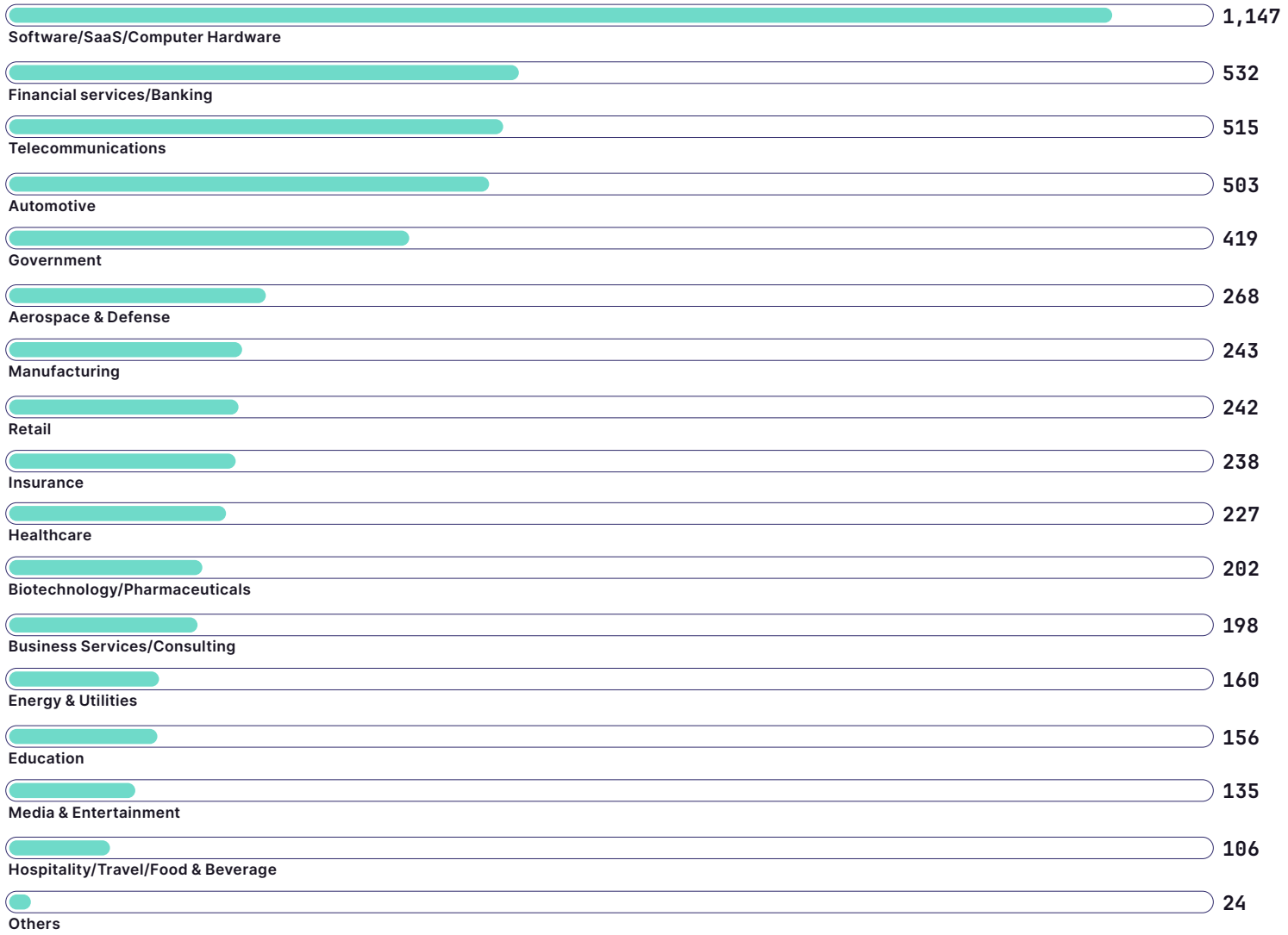
Job role



Geography


11%
UK
561
12%
Germany
634
6%
France
298
7%
Canada
396
44%
US
2,335
4%
Japan
211
3%
India
150
2%
New Zealand
105
7%
Australia
397
4%
Other
228

Industry


Software/SaaS/Computer Hardware
1,147
Financial services/Banking
532
Telecommunications
515
Automotive
503
Government
419
Aerospace & Defense
268
Manufacturing
243
Retail
242
Insurance
238
Healthcare
227
Biotechnology/Pharmaceuticals
202
Business Services/Consulting
198
Energy & Utilities
160
Education
156
Media & Entertainment
135
Hospitality/Travel/Food & Beverage
106
Others
24

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