

SURVEY RESULTS & INSIGHTS

The Global CTO Survey 2020

In the year when everything changed, what are CTOs focusing on?

It's cliché to talk about how everything is different after the COVID-19 outbreak, so we're not going to even try.

In the realm of technology and IT, the competition to succeed, gain market share and enchant users and businesses alike is as fierce as ever.

CTOs and their software teams are at the forefront of this conflict, fighting to make their mark on the business landscape.

To win the fight as a CTO, you need the right intel. Which is why we reached out to CTOs around the world and asked them:

- What are your challenges and how are you tackling them?
- What technologies and methodologies are you investing in?
- How are you hiring for your teams and managing your people?

The result is the report you're reading now: the very first edition of our Global CTO Survey. Use it to inform your choices in the coming months.

The survey in numbers

CTOs are notoriously busy, so we're especially proud that we managed to reach so many and get responses to our survey. The survey went deep into several aspects of the CTO's job, from tech stack choices through hiring tactics to their investment in self-development. Thankfully, many CTOs decided to share their experiences. This allowed us to prepare a report that's representative and informative.



50

Questions in the survey

Covering everything from tech stack choices to hiring practices and self-development.



+250

Total responses

From CTOs all over the world.



45 min.

Average time to fill out the survey

Huge thanks to all the CTOs who invested their time to answer our questions!

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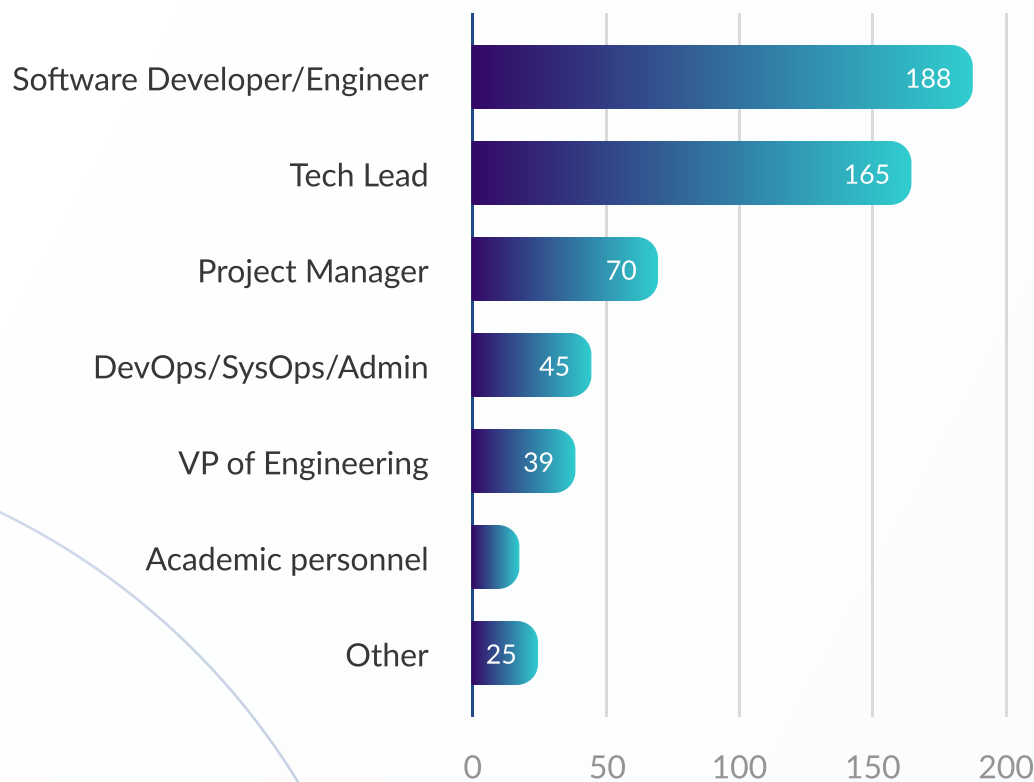
01 Career path

How long does it take to become a CTO?

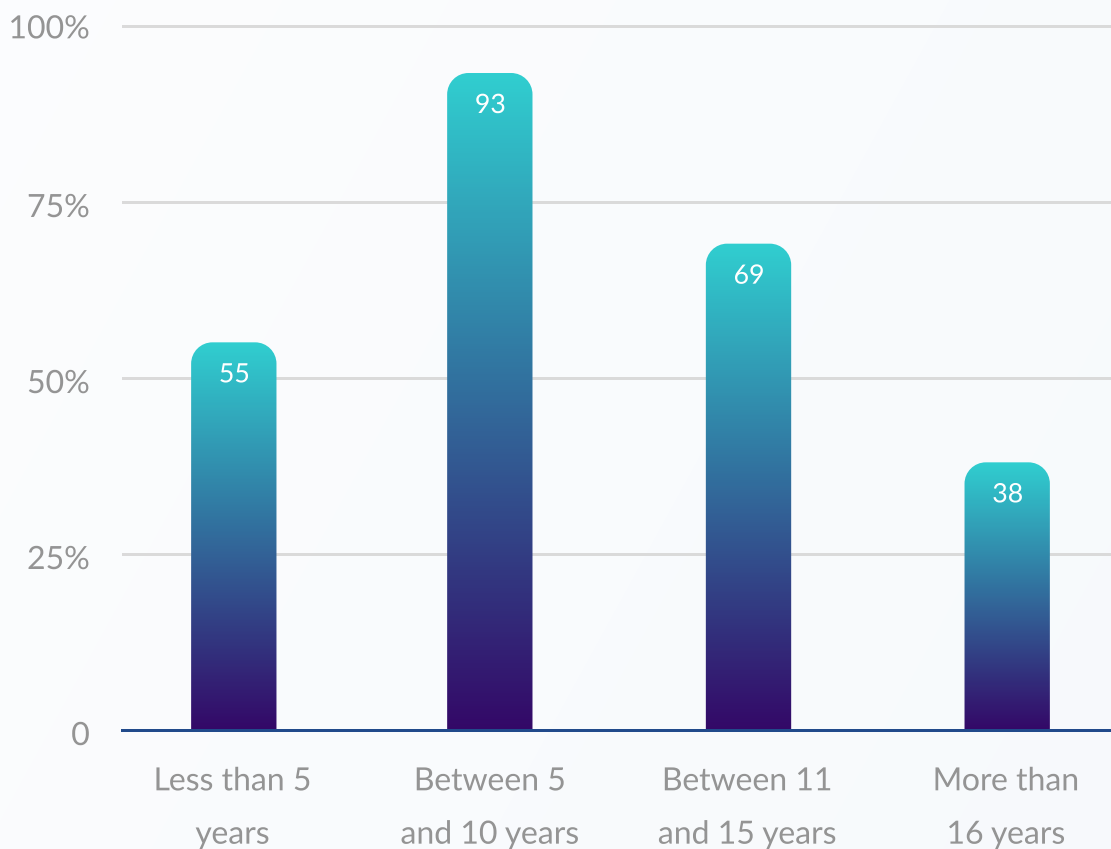
The road to CTO is (usually) long

For 78% of the respondents, becoming a CTO took 5 years or more; 42% didn't become a CTO until over a decade into their career. Most of the respondents were Software Engineers and/or Tech Leads in the past; on average, they took on at least two different roles before transitioning to CTO. The median amount of companies respondents worked at before becoming CTO was three.

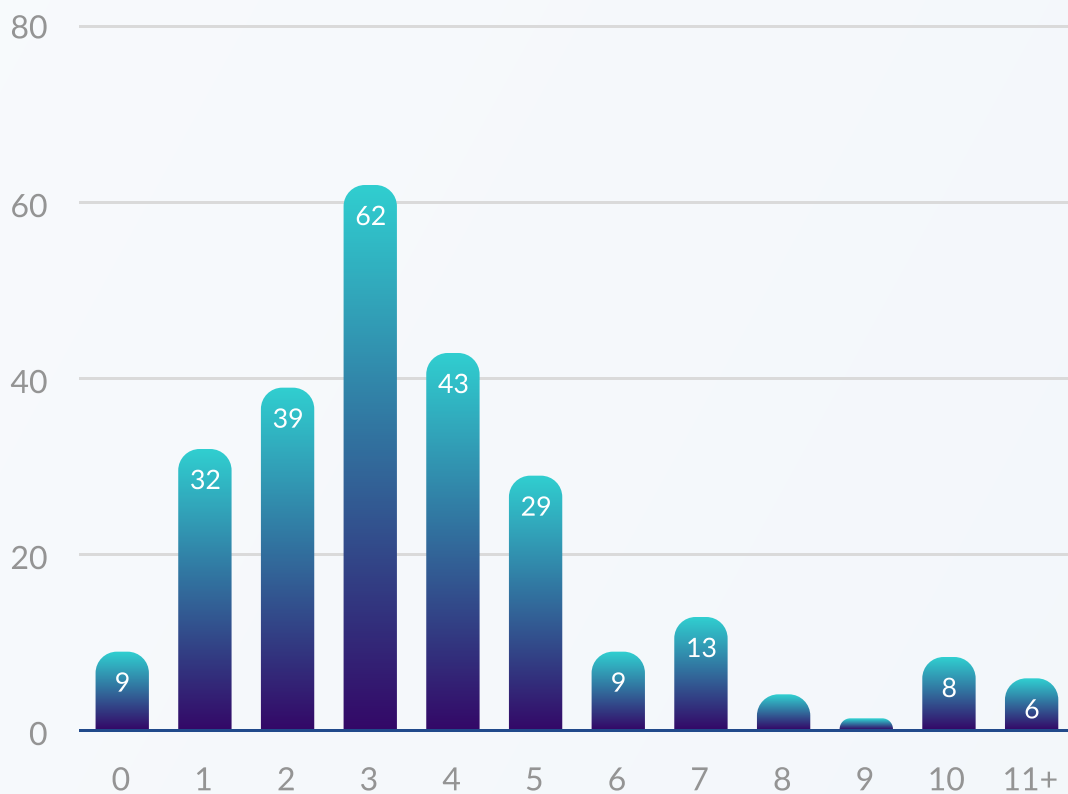
Previous positions before becoming CTO



From the beginning of your career, how many years did it take you to become a CTO?



How many companies / organizations did you work at before you became a CTO?



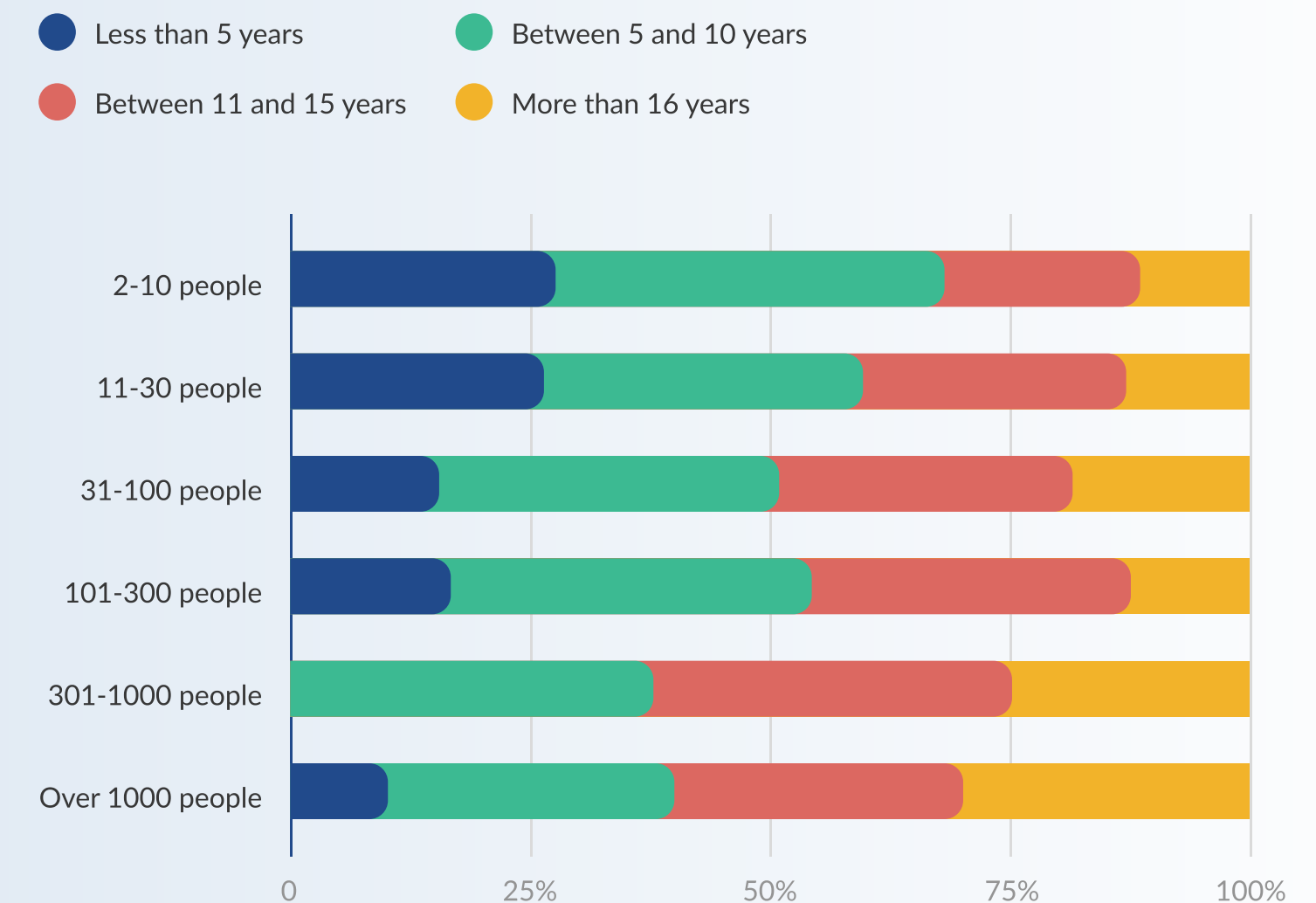
The fastest way to become a CTO:

claim the title while joining a small organization

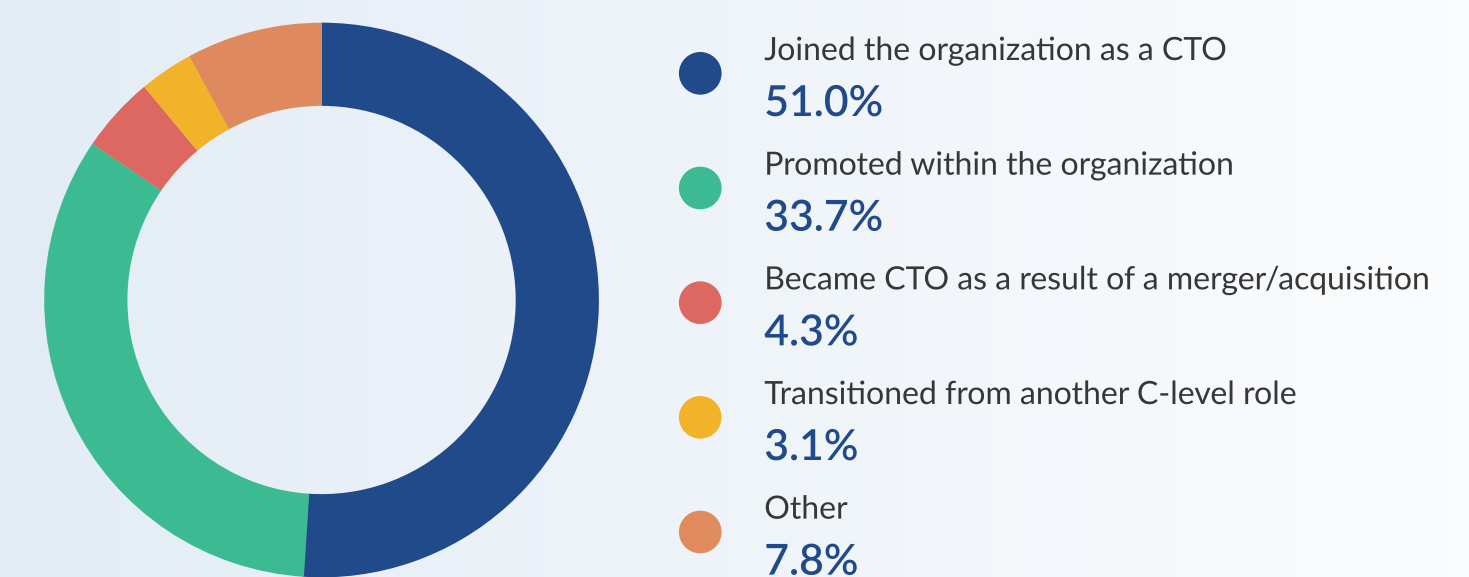
There's a big difference between being a CTO founder of a startup and leading a global corporation as a CTO. Our data reflects this; **respondents working at larger organizations typically reported that it took them longer to become CTO: from 5 up to 16+ years.** Corporate CTOs were also noticeably older than other respondents—from 33 to 55 years old.

As for the actual steps taken to become CTO, over half of the respondents assumed the role when they joined an organization (both joining an established organization as well as founding a new one fall under this category). The second most common case was getting promoted—meaning there's still hope for those with CTO ambitions who aren't eager to jump ship.

Time to become CTO by company size



How did you become a CTO?



Expert commentary

“One question during a recent series of interviews with global tech leaders asked, What are the key attributes of successful tech leaders?”

Overwhelmingly the answers were about the soft skills, about authenticity, empathy, and emotional intelligence. Another key factor is communication and particularly, an ability to communicate with non-technologists in the language of business, not just tech.

Andrew Weaver

CEO @ CTO ACADEMY

CTO Academy is a professional growth and career development platform for tech leaders to achieve the career and reward they deserve.



02 Tech stack

What technologies
are CTOs using to
build their software?

The most popular languages:

JavaScript/TypeScript, Python, Java, and PHP

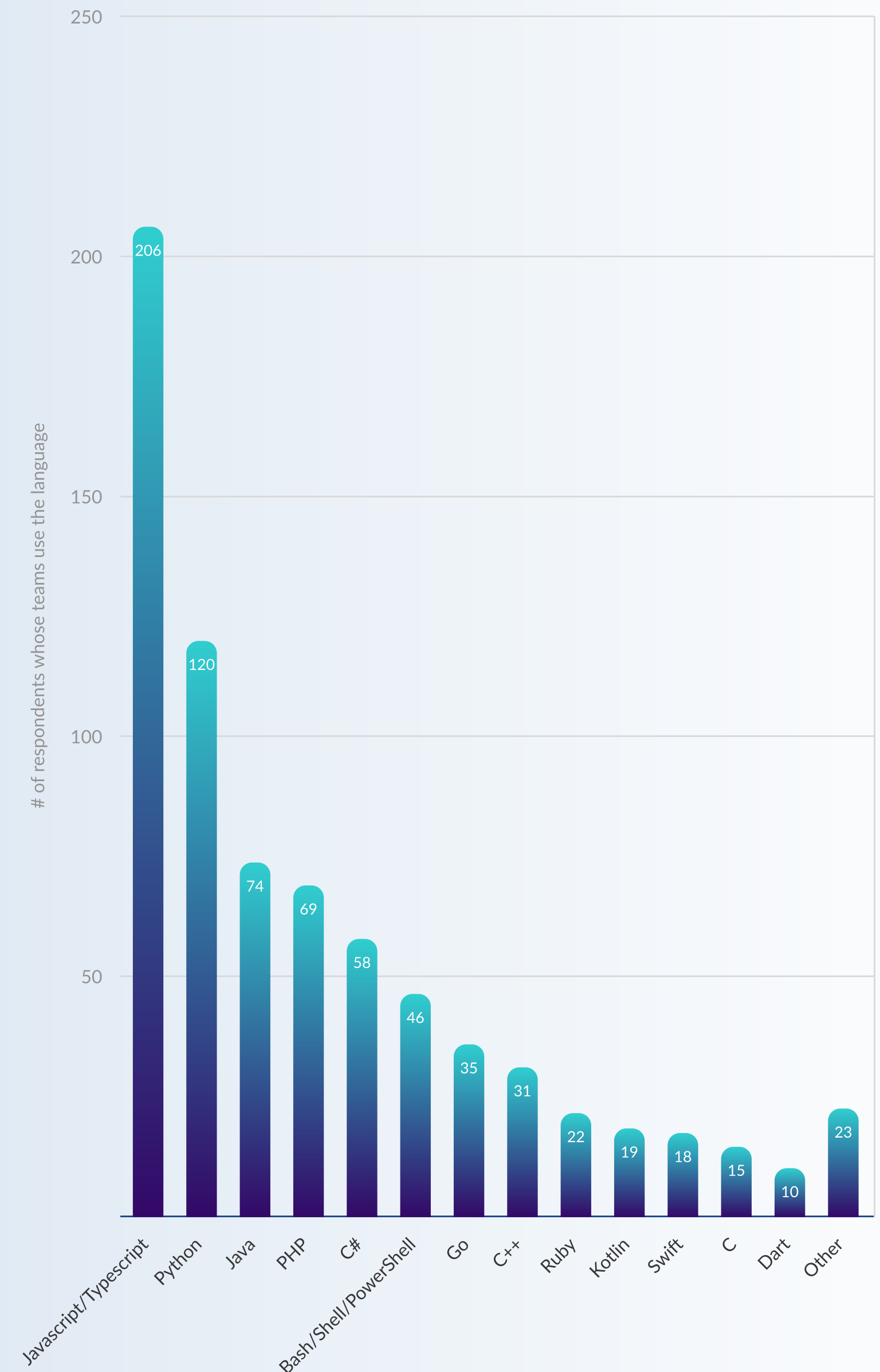
It's hard to find a CTO among our respondents who doesn't use JavaScript (or TypeScript) in their tech stack. That's probably because of the language's versatility: in 2020, JavaScript can be used not just as a frontend language, but also server-side via Node.js and to create cross-platform mobile apps with React Native.

The runner-up is Python, often praised for its versatility, ease of use, fast time-to-market, and wealth of existing libraries and solutions. CTOs need to get their products up and running quickly to beat the competition; Python helps with that.

Closing out the top 4 pretty much neck-in-neck are Java and PHP, both well-entrenched languages, especially in larger organizations.

Also worth noting is that one language rarely gets the job done for CTOs. **On average, the respondents' teams used 3 different languages in their tech stack.**

What are your teams' primary programming languages?

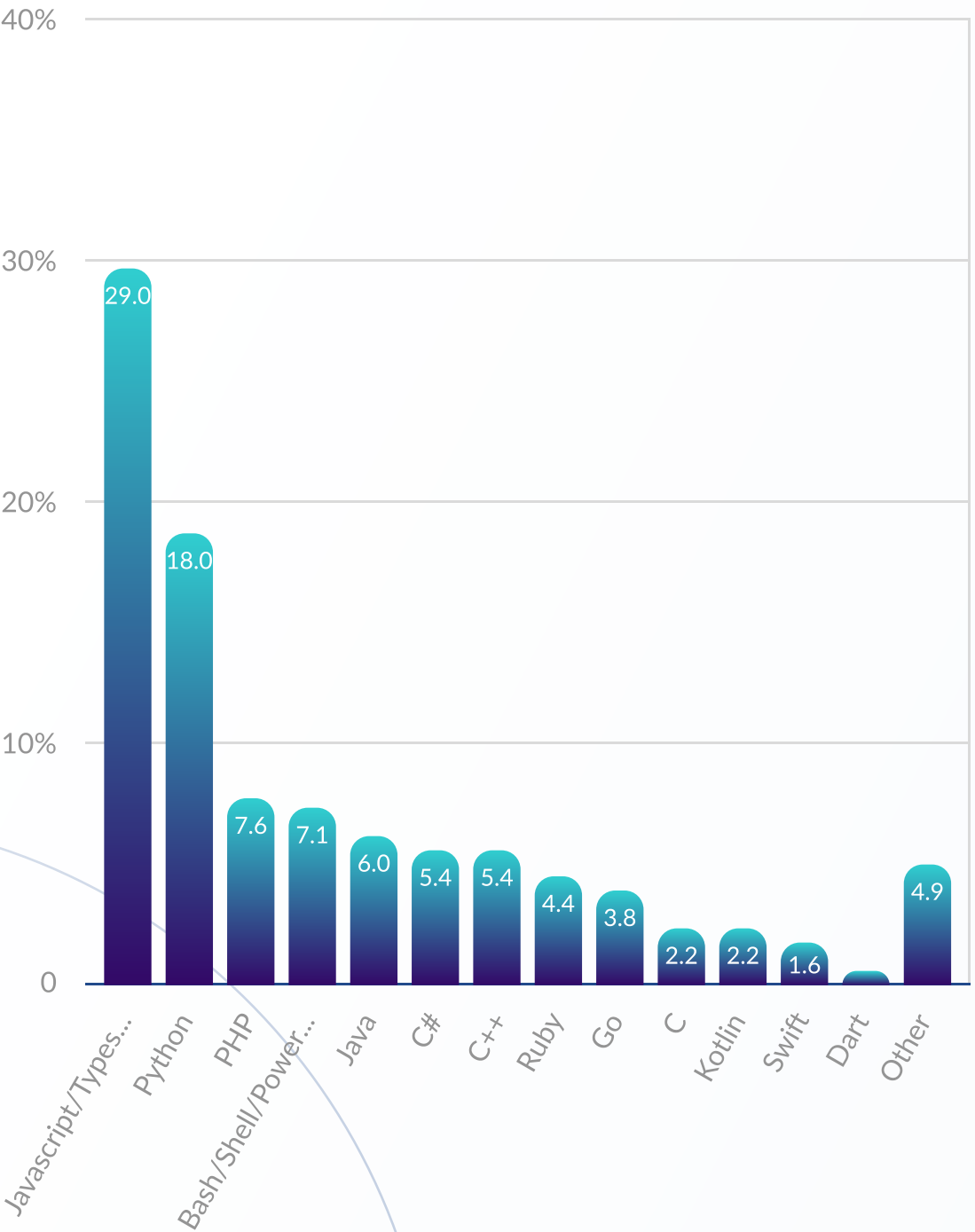


Different needs, different code

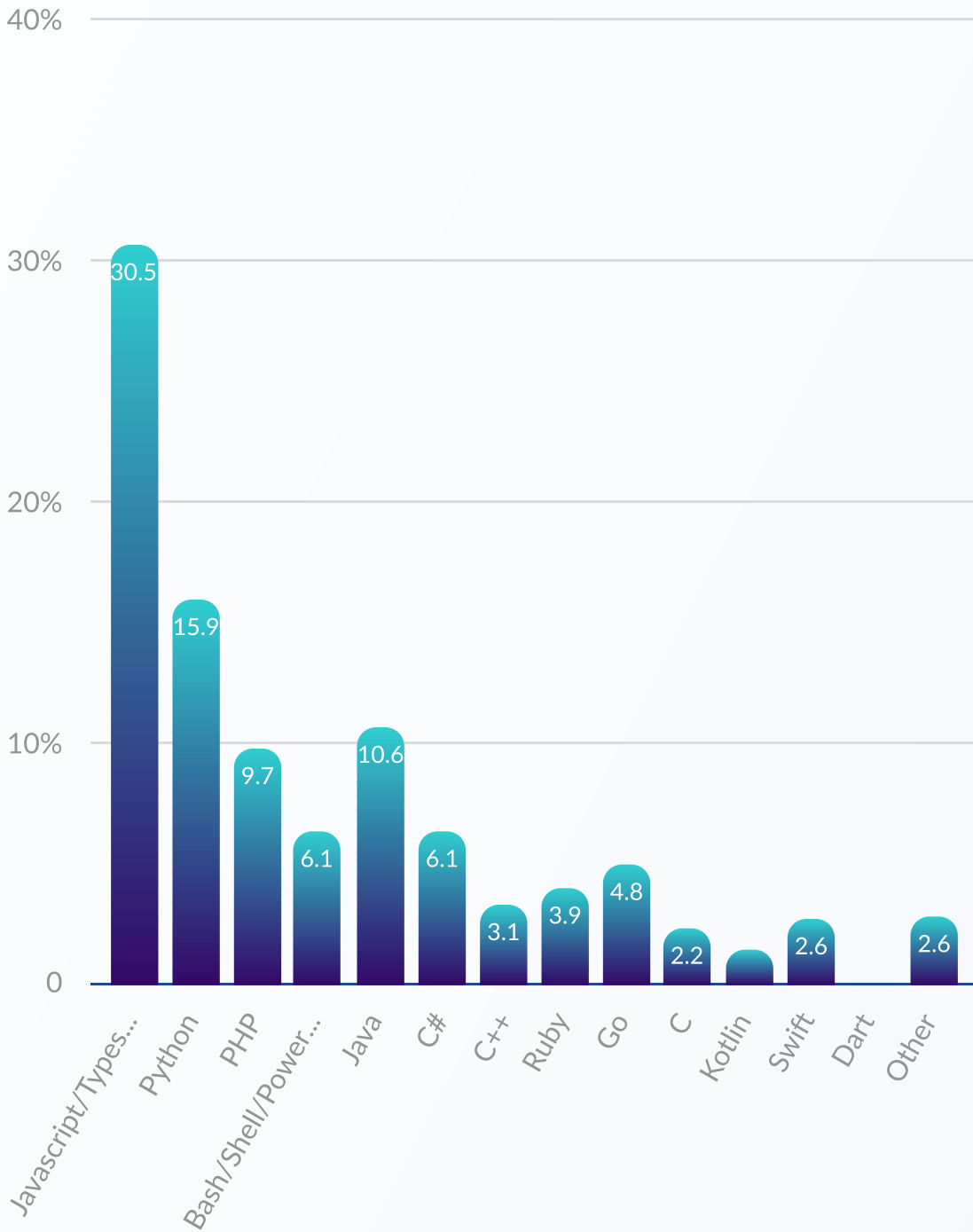
Depending on the company size, there are noticeable differences in the programming languages chosen by CTOs' teams.

Language popularity by company size

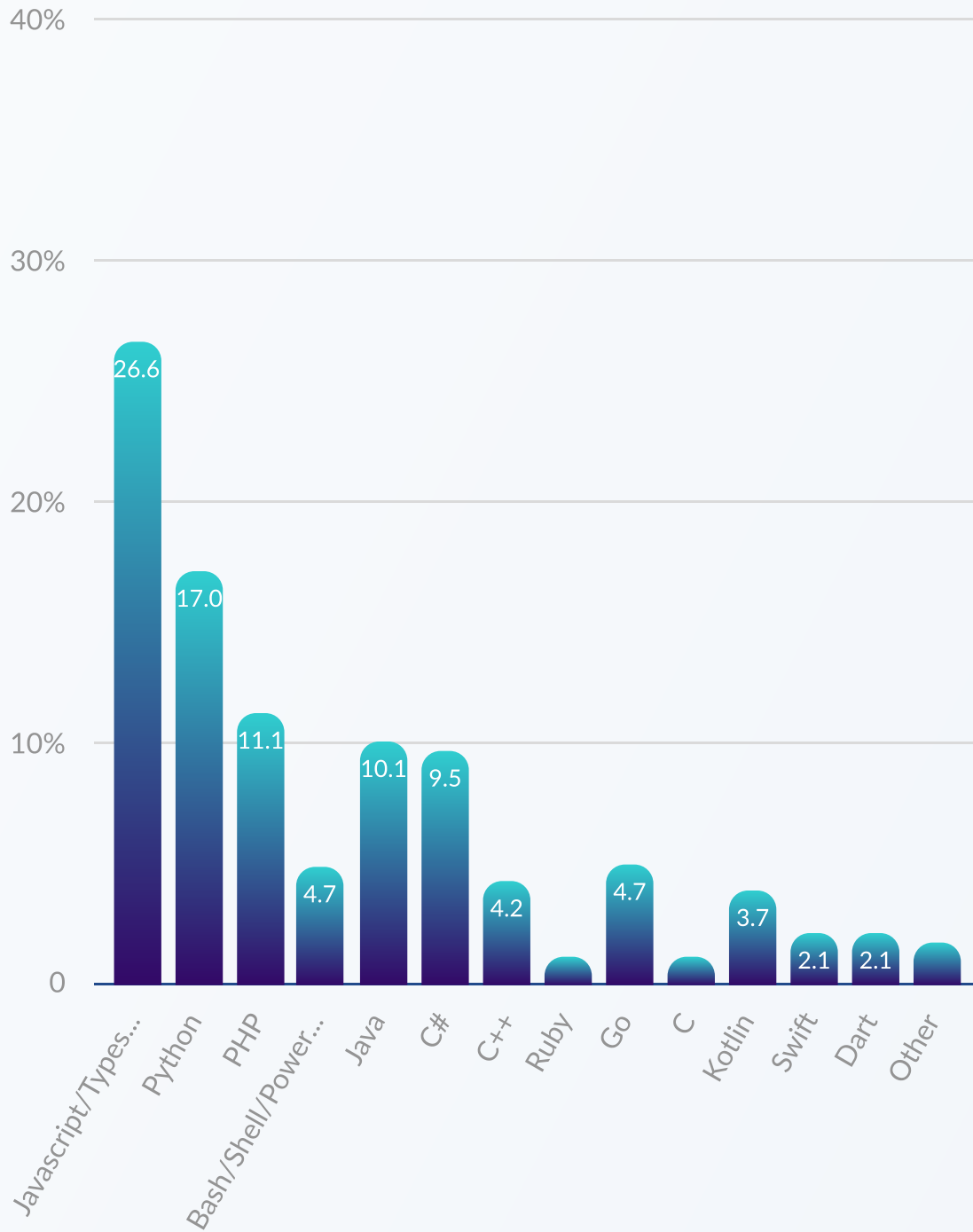
2-10 people



11-30 people



31-100 people

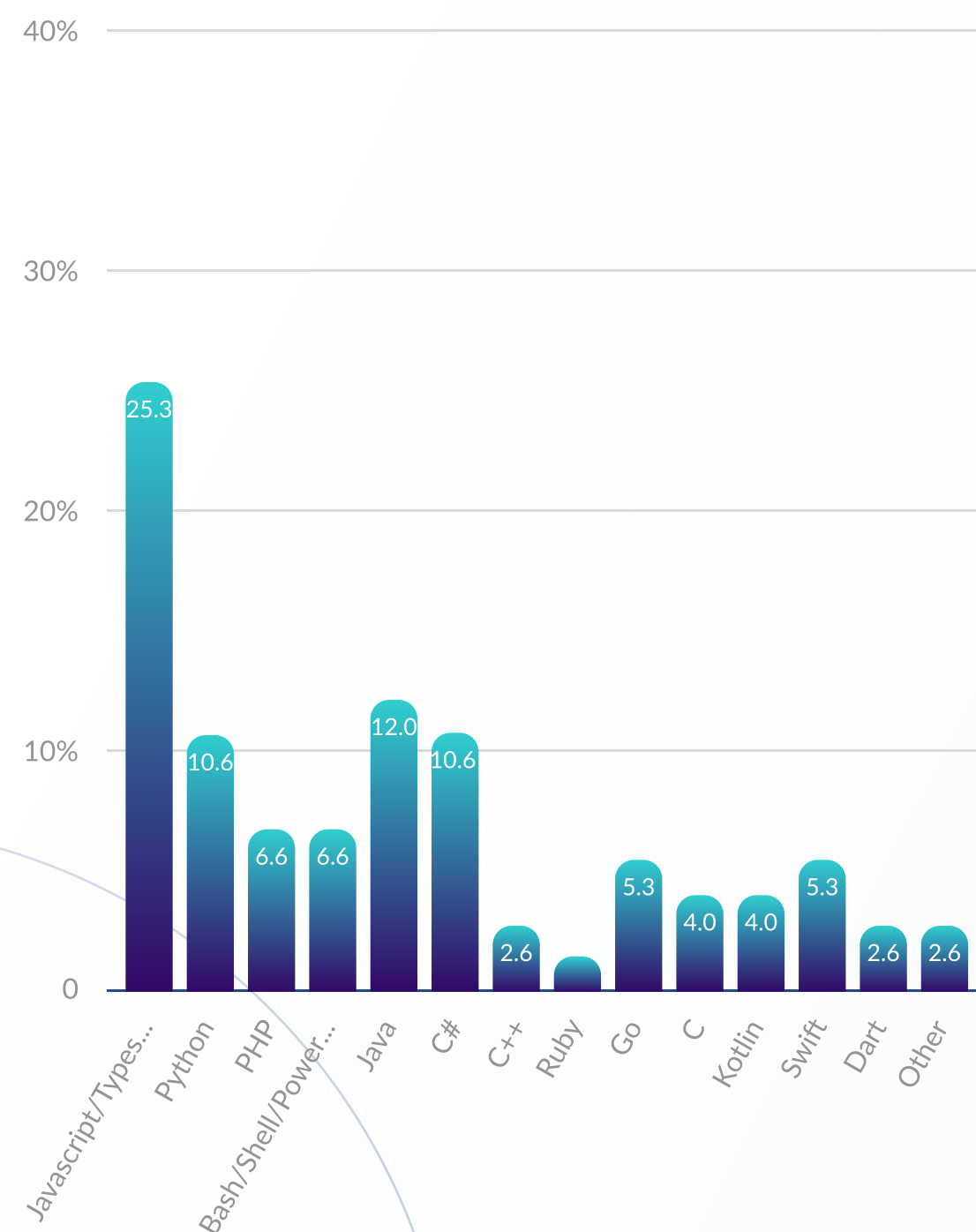


C#, PHP, and Java are used more at larger companies

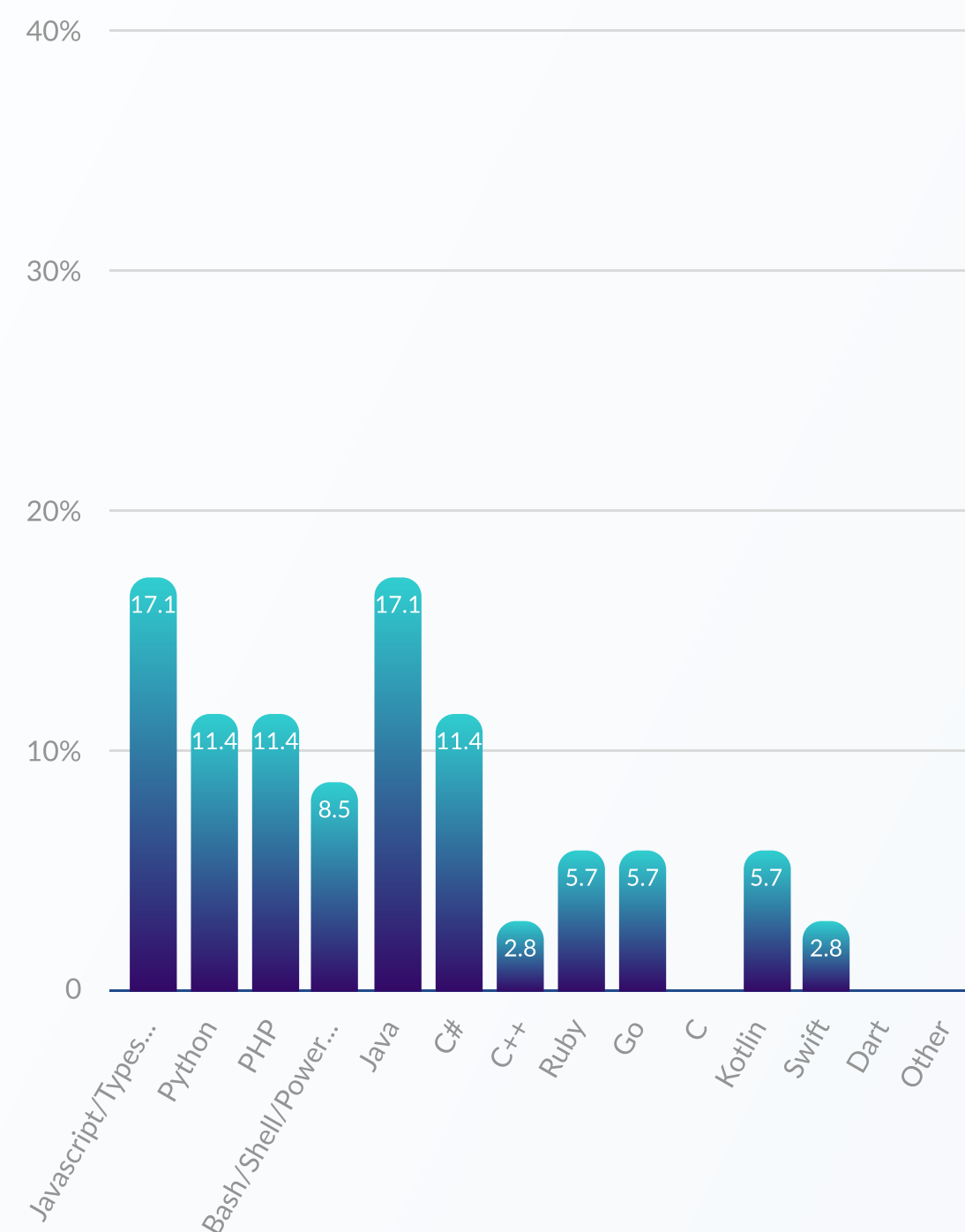
However, JavaScript/Typescript remains popular across the board, no matter the company size.

Language popularity by company size

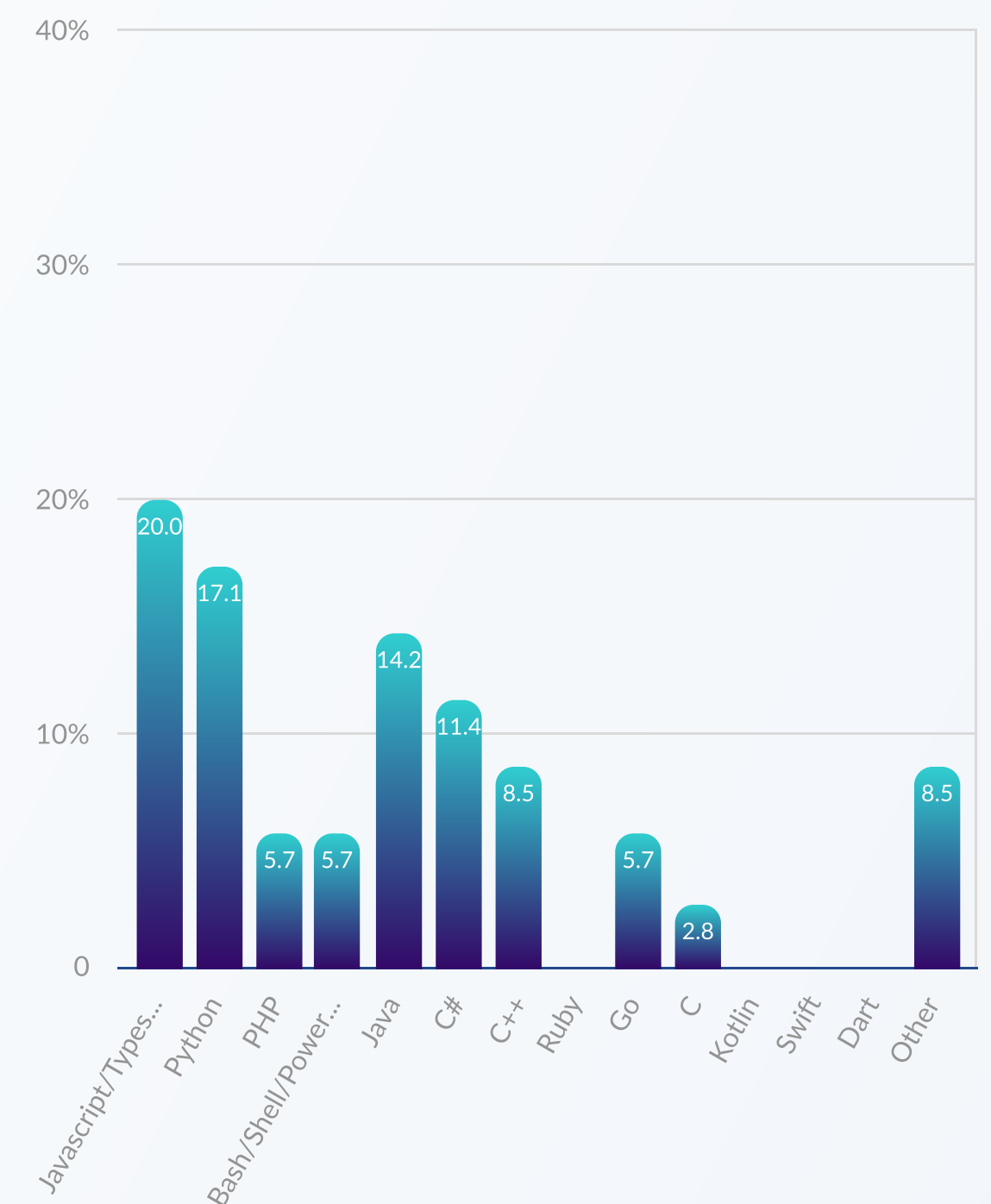
101-300 people



301-1000 people



Over 1000 people

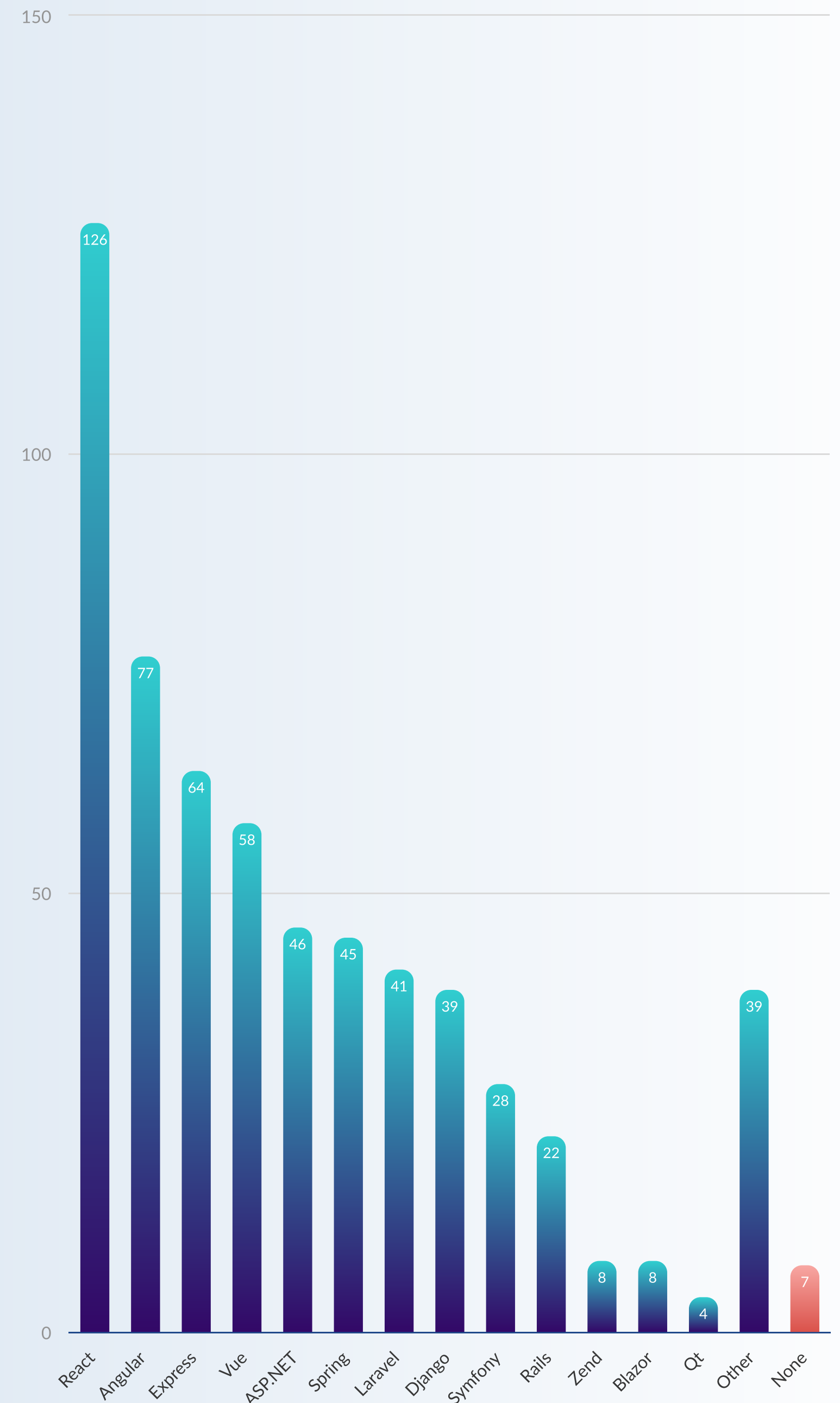


The top 4 web frameworks were JS frameworks, with React leading the way

The most popular web frameworks used by our respondents' teams were React, Angular, Express, and Vue. React is the clear leader in the JavaScript space; it was nearly twice as popular as the runner-up.

Among non-JavaScript frameworks, ASP.NET, Spring, Laravel, and Django were the leading solutions for their respective languages. The common denominator between them seems to be strong support, either from Microsoft in the case of ASP.NET or the open source community for Spring, Laravel, and Django.

Most popular web frameworks

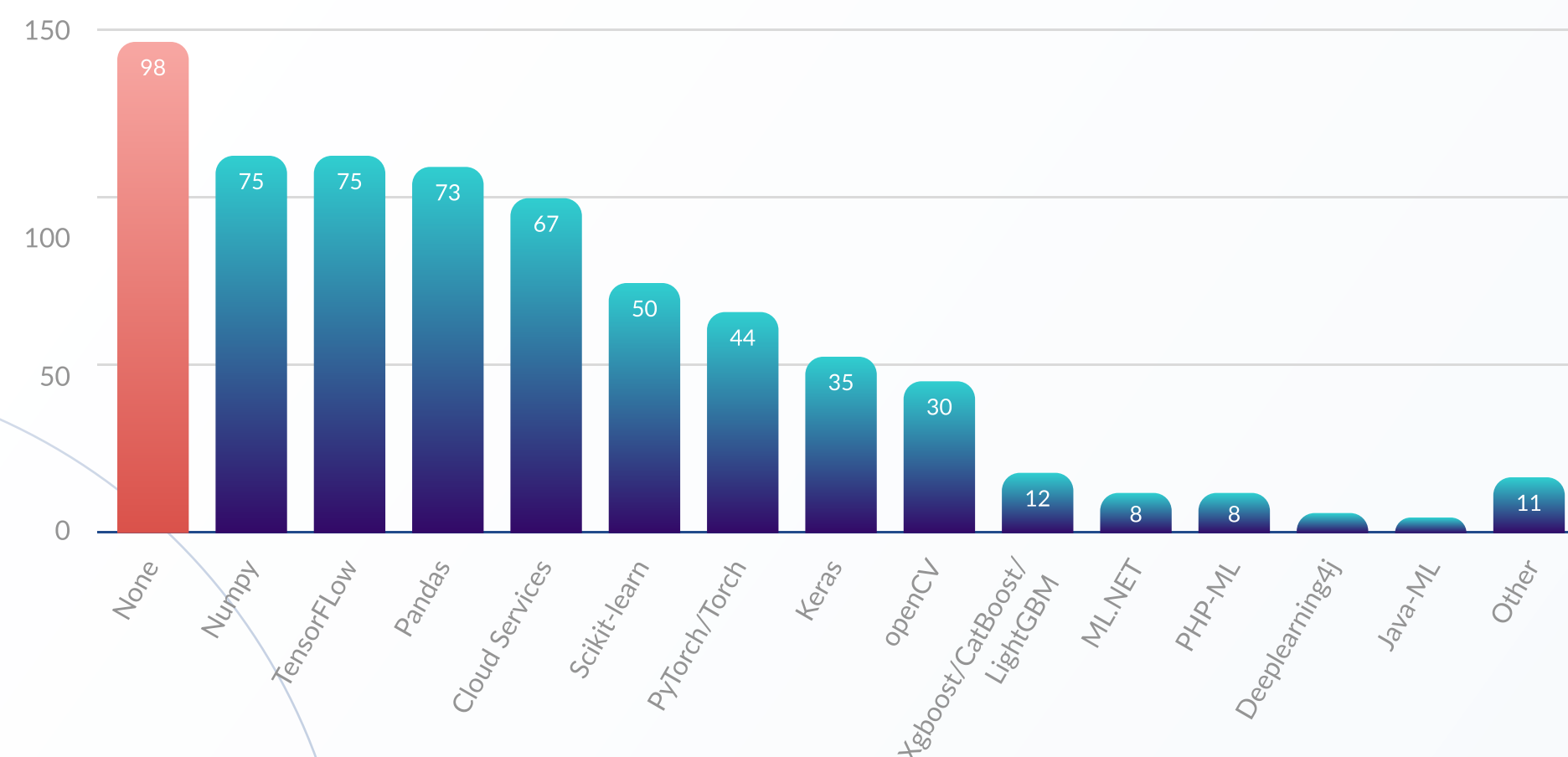


Python is the king of data science

Some of the top data science frameworks included NumPy, TensorFlow, and Pandas—but 38% of the respondents didn't use one at all. This indicates that **over a third of our respondents are not leveraging the potential of data science.**

Since NumPy and Pandas are Python libraries, it's no surprise that they are the top choice for Python teams. But TensorFlow can be used with various other languages, and yet our data shows that it's still used most commonly with Python. The correlation between using data science frameworks and using Python shows that Python is the most important language in the field of data science.

Most popular data science frameworks



Jerzy Kowalski

SENIOR FULL-STACK DEVELOPER @ STX NEXT

The results of the survey confirm that it's hard to imagine a data science project without NumPy and/or Pandas. Even if they are not used directly, their fundamental data structures, namely ndarrays and DataFrames, are often used to represent data when using other libraries from the Python scientific stack.

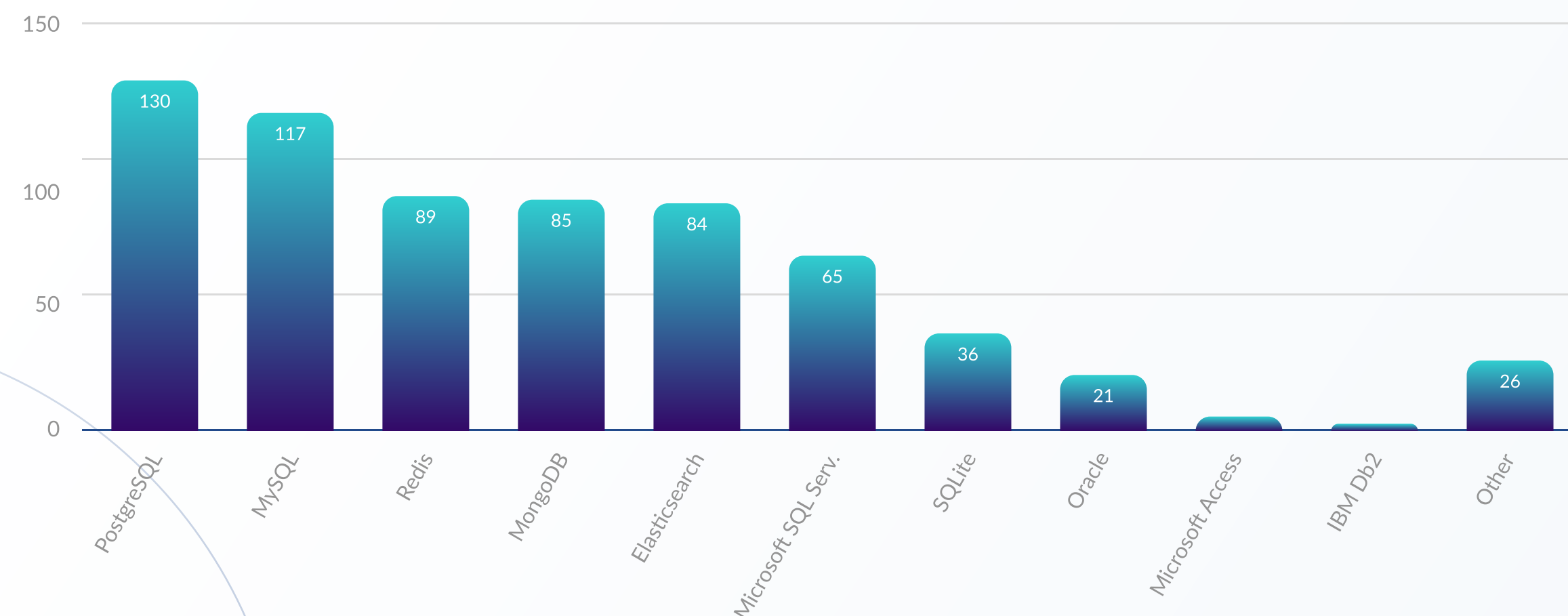
It is also worth noting that the most popular deep learning framework, TensorFlow, is by far more popular than the most popular "old-school" machine learning framework, Scikit-Learn. This proves that the boom in productionizing machine learning solutions in recent years is mainly due to deep learning algorithms, which can provide results that were impossible to achieve ever before thanks to massive volumes of data.

The choice of language often influences the choice of database solutions

PostgreSQL is the leading database solution, in hot competition with MySQL. They were followed by Redis, MongoDB, and Elasticsearch pretty much tied for third.

Breaking down the data by company size, we found that the smallest companies (2-10 people) picked PostgreSQL more often than MySQL. However, as company size increases, the popularity of PostgreSQL and MySQL becomes pretty much equal.

Most popular databases



Łukasz Grzybowski

HEAD OF MACHINE LEARNING
AND DATA ENGINEERING
@ STX NEXT

One interesting finding from our data is that the teams' choice of programming language often influences the choice of database solutions. The most popular database, PostgreSQL, is the primary choice for Python teams. However, there's a clear synergy in the technologies supported by Microsoft: C# teams most often use Microsoft SQL Server. It's also curious to note that PHP developers most often use MySQL.

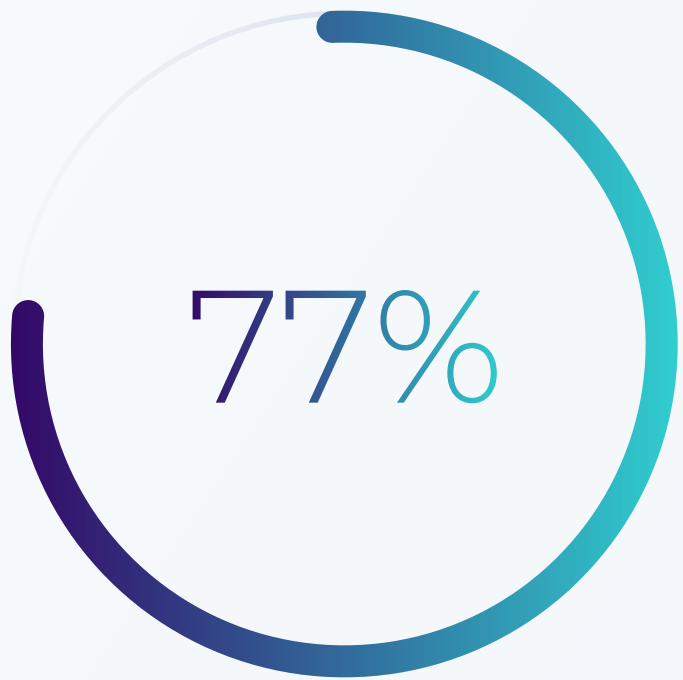
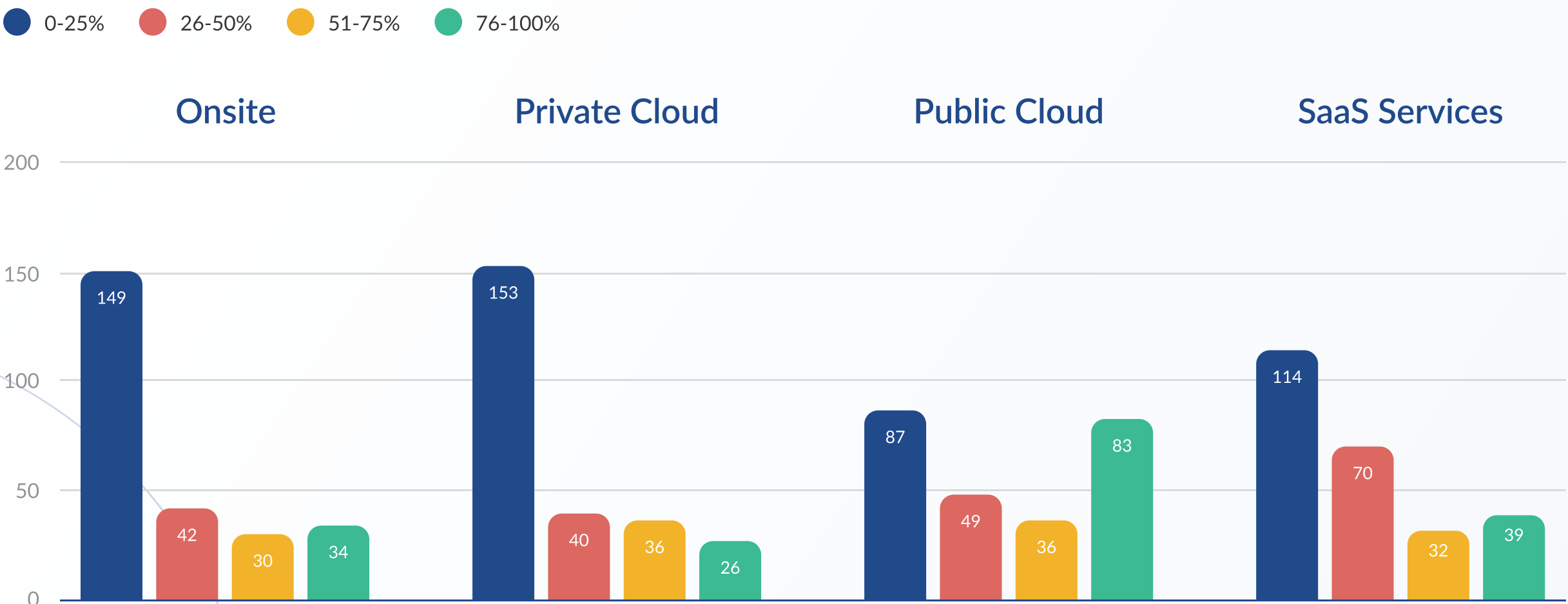
CTOs' teams work a lot in the public cloud

When asked where their teams' work takes place, CTOs most typically report that the majority of the work takes place in the public cloud. Whether it's to reduce dependency on owned hardware or bring down the total cost of ownership, CTOs seem to be moving away from onsite solutions.

That's unsurprising given the long list of costs incurred by on-premises hosting: the cost of the servers, the space they're in, the electricity bill, cooling, and the salaries of the admins managing the servers. Scaling server capacity up and down to meet current demand is also much more complicated on-premises compared to working in the cloud.

CTOs' teams also get work done within SaaS solutions, but it's not a ubiquitous trend—45% of respondents reported they hardly use SaaS solutions at all.

What percentage of your work takes place in each of the following?

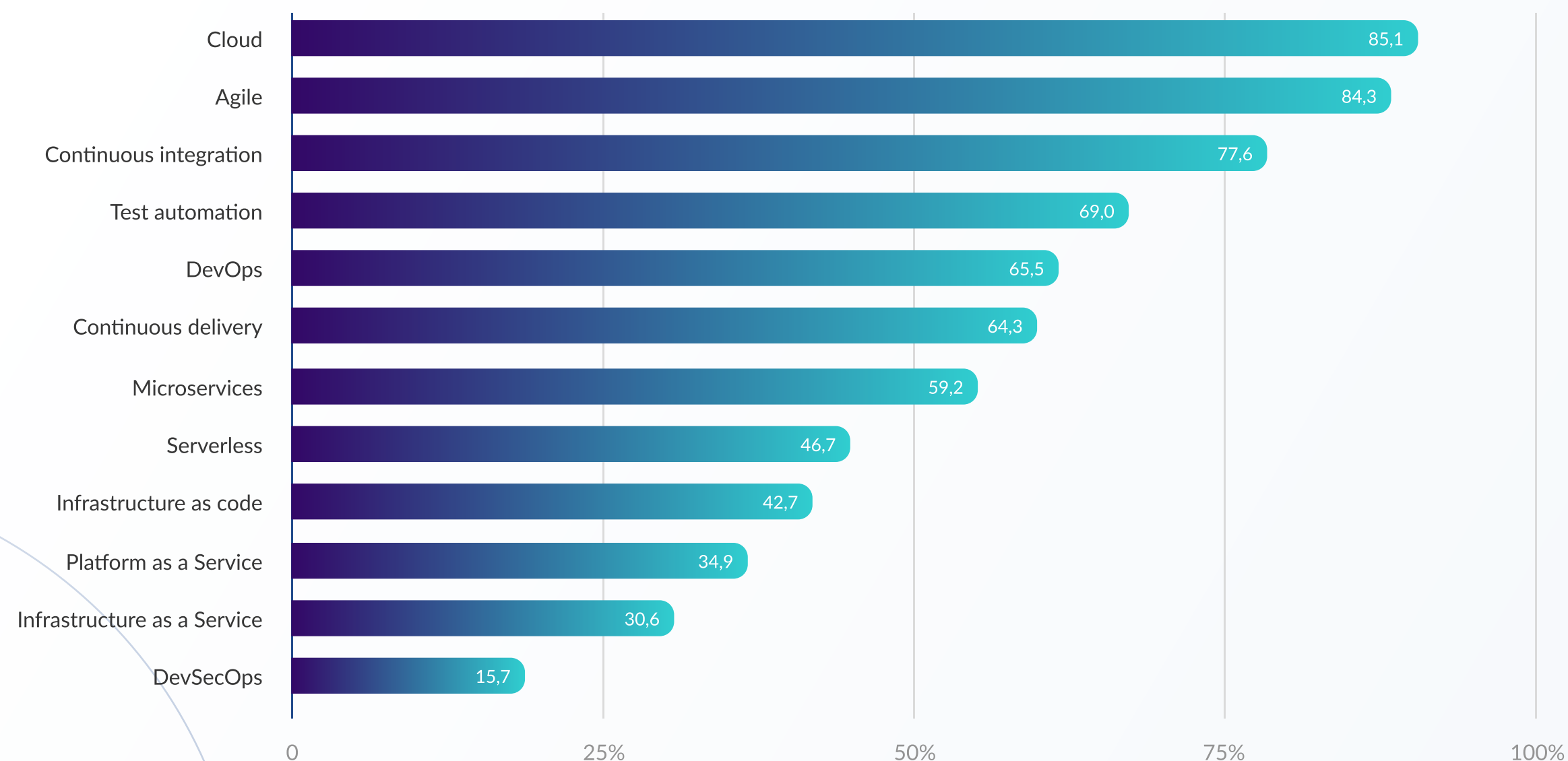


**respondents' organizations
are currently developing
cloud-native technologies**

Over 75% of CTOs are using Cloud, Agile, and Continuous Integration

We asked our respondents whether they have adopted some of the industry's trending practices. The average CTO develops software in the cloud using Agile methodologies. Their teams also apply test automation to safeguard quality. On the delivery front, more often than not CTOs are already using CI/CD and DevOps. Microservices seem to be slowly transitioning to an industry standard; over half of our respondents have implemented them. On the flipside, Platform as a Service, Infrastructure as a Service, and DevSecOps are among the least adopted practices.

Which of the following have you implemented?



Szymon Piasecki

HEAD OF DEVOPS @ STX NEXT

Cloud providers naturally fulfill the needs of flexibility introduced by Agile methodologies. Using the Cloud is a major benefit to speed up the time-to-market of the product. Companies realized that the typical work of DevOps with CI/CD and automated tests is much easier, cheaper and predictable with the Cloud. From a budget perspective, controlling infrastructure costs is crucial; Cloud solutions make that easy.

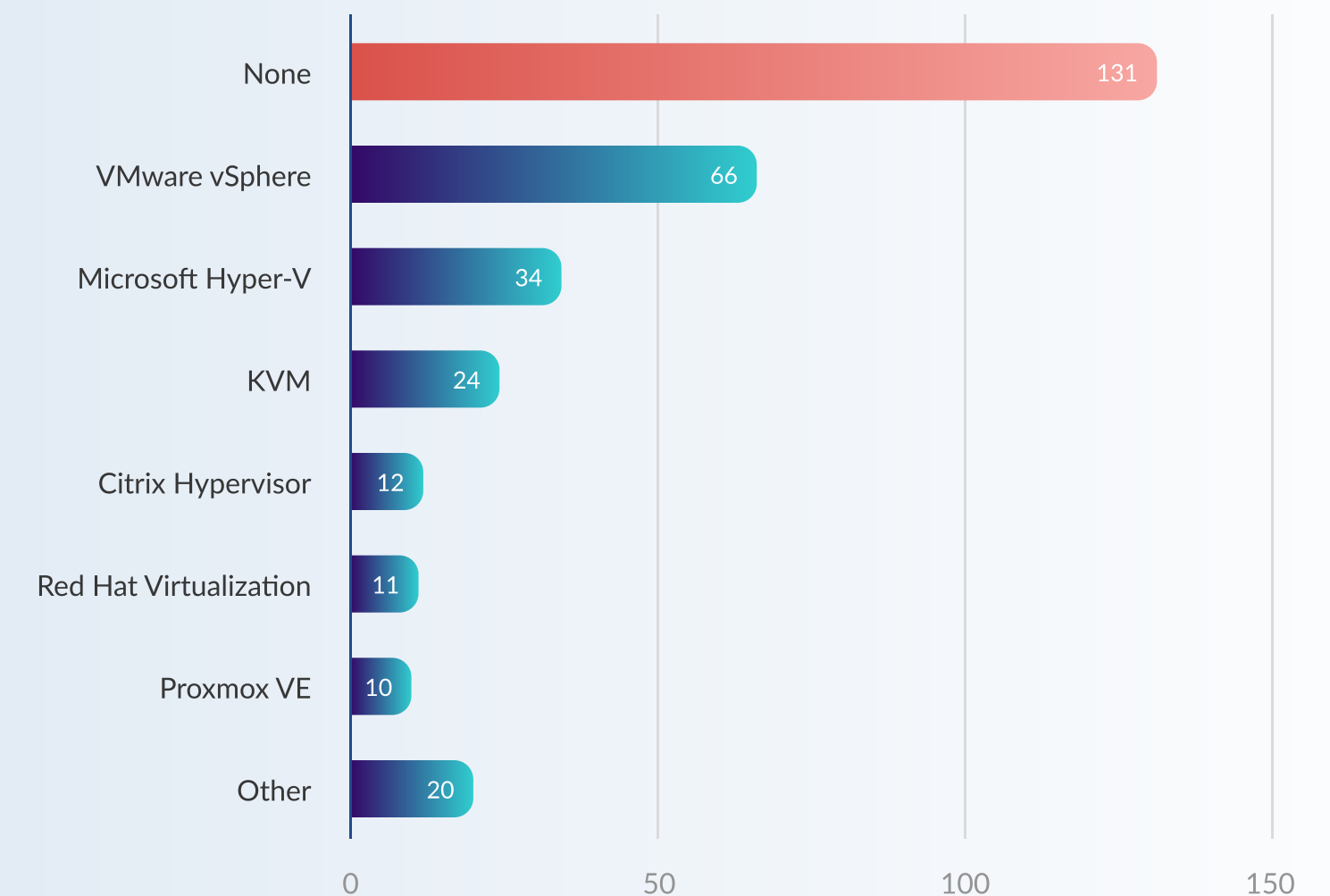
Server virtualization and containerization tools

Roughly half of our respondents don't use server virtualization software; among the other half, VMware or Microsoft Hyper-V are most commonly used.

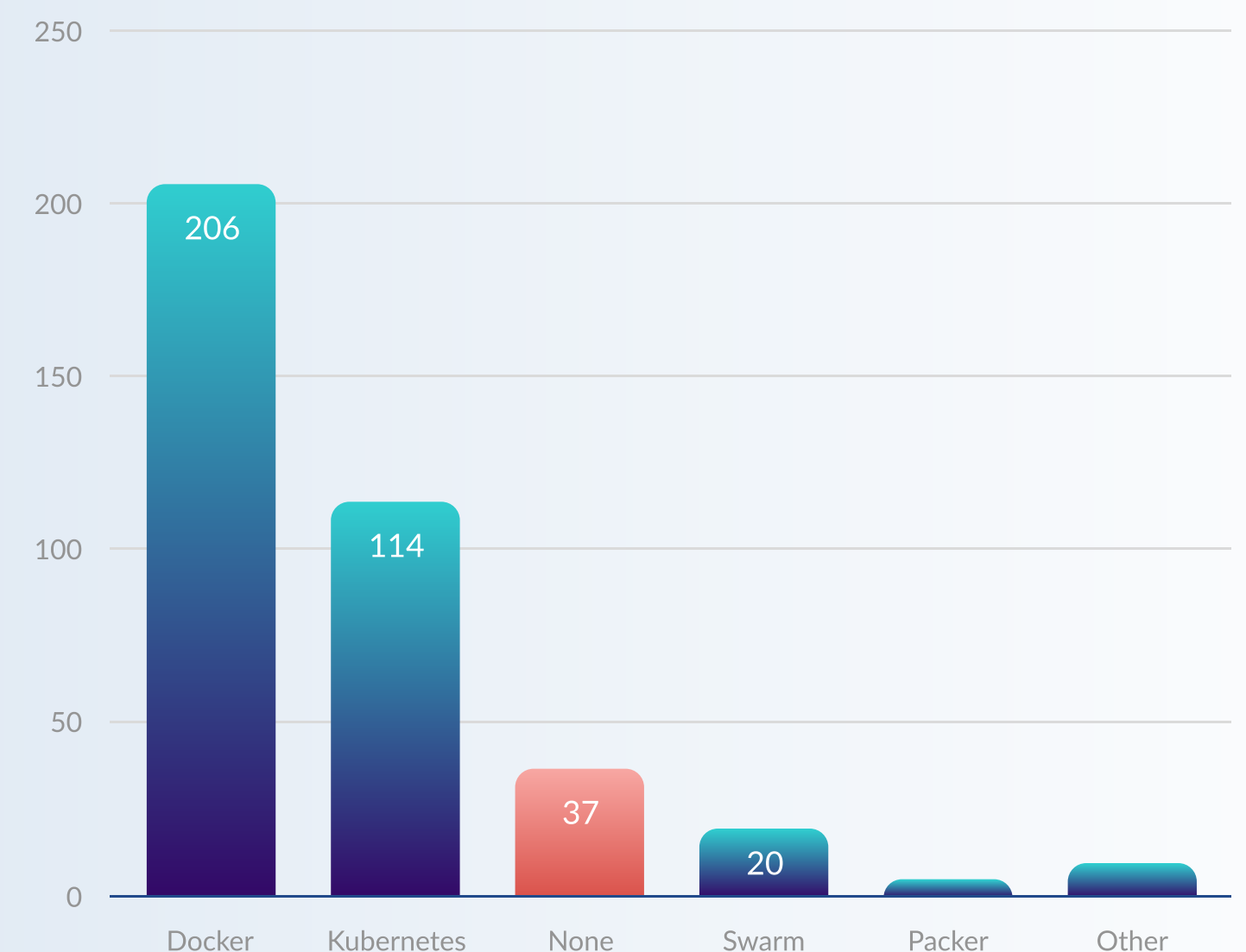
Adoption of containerization tools is much higher, with Docker and Kubernetes as the most popular choices.

Applications based on Docker are particularly widespread and easy to manage, which may be one reason for the popularity of containerization over virtualization. Apps that support containerization can easily be moved between operating systems, making cooperation between Dev and Ops much easier and preventing compatibility issues. Thanks to Docker images, the popular scenario of “that’s weird, it works on my machine” is becoming increasingly rare, because such apps work the same both on the developer’s machine and in the live production environment.

What server virtualization software do your teams use?



What containerization tools do your teams use?



40% of respondents aren't monitoring their infrastructure for performance issues

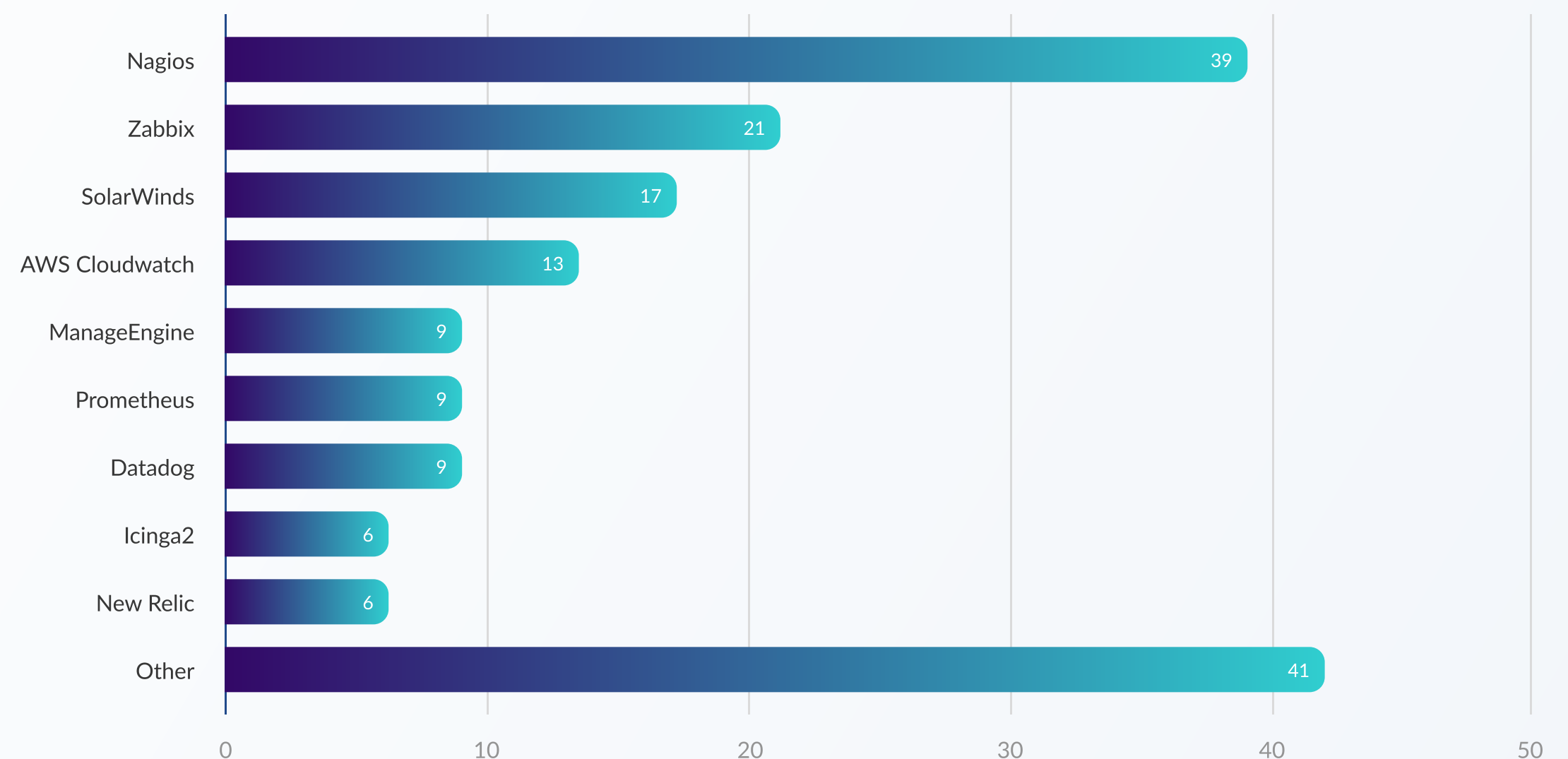
It appears that a significant portion of our respondents haven't reached the point where they would consider monitoring the infrastructure on which their applications are deployed. This might be due to budget constraints, small scale or lack of maturity of their digital business, or other factors.

On top of that, **respondents that have implemented monitoring mainly use older generation and/or open source tools**, including Prometheus, Nagios, and Zabbix.

Have you implemented any infrastructure/network monitoring solutions?



What infrastructure monitoring solutions have you implemented?



1 in 3 CTOs haven't implemented solutions to monitor their app performance

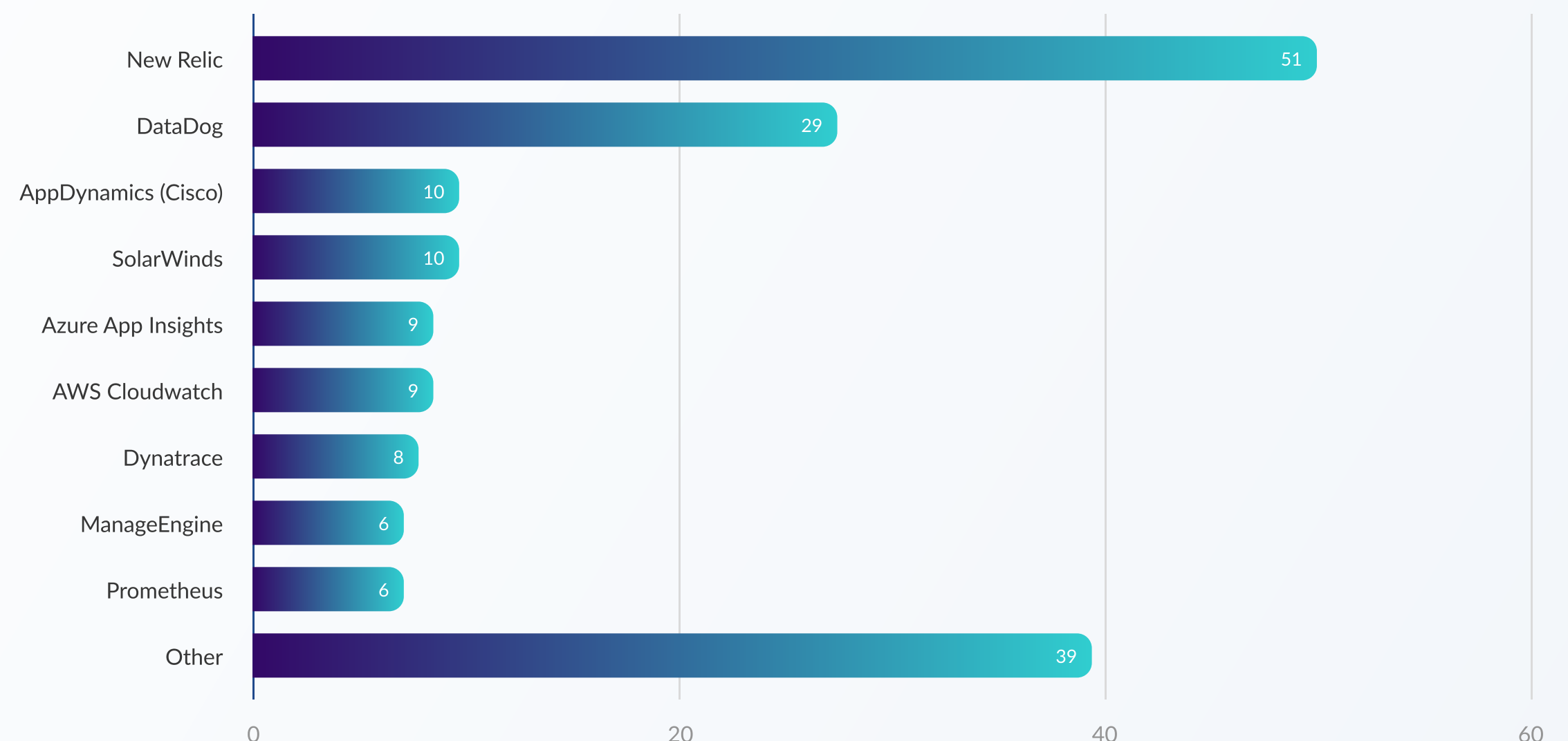
Users' expectations towards app performance are as high as ever, and simply monitoring the infrastructure is not enough. Any issues related to general app performance, whether they stem from the infrastructure or the code itself, need to be detected early and resolved quickly.

We asked the respondents about their approach towards monitoring app performance, and the results paint a more optimistic picture compared to infrastructure monitoring—but only just. Adoption of such tools is at 63%, and many of them are mature and effective monitoring suites such as Dynatrace, AppDynamics, and the #1 choice: New Relic.

Have you implemented any application performance monitoring solutions?



What app performance monitoring solutions have you implemented?



03 Security

How are CTOs
protecting their data
and intellectual
property?

Dedicated security teams are a rarity in companies smaller than 300 people

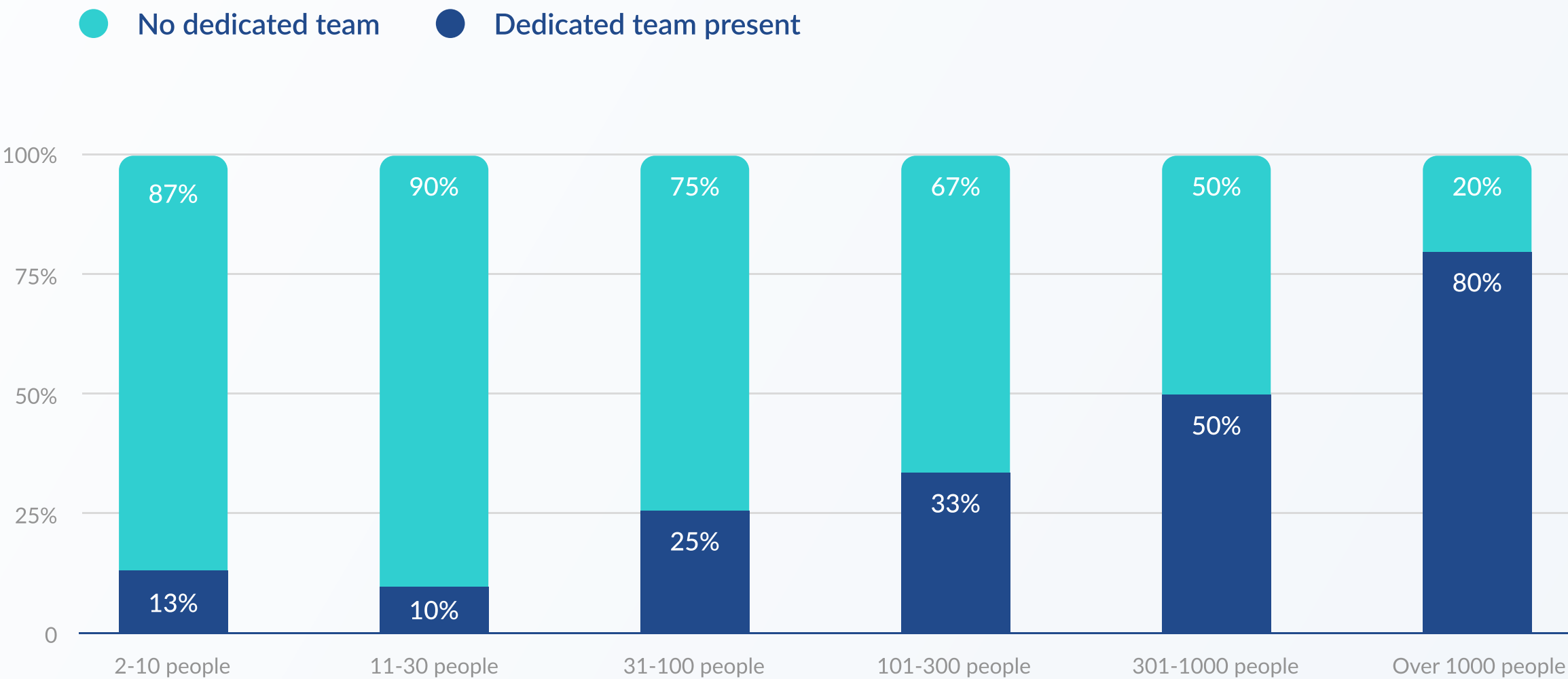
Only 20% of our respondents have a dedicated security department in their organization. However, the proportion shifts significantly with company size; larger companies are much more likely to have a dedicated team.

It seems that many organizations still see security as a cost rather than an investment. However, one should bear in mind that for smaller organizations, the cost of a security team is significant relative to the size of the entire budget. Coupled with limited awareness of potential security issues and a focus on fast time-to-market, this may be pushing smaller companies to postpone work on security.

Do you have a dedicated team or department providing security services in your organization?



Implementation of dedicated security teams by company size



40% of the respondents are outsourcing their cybersecurity

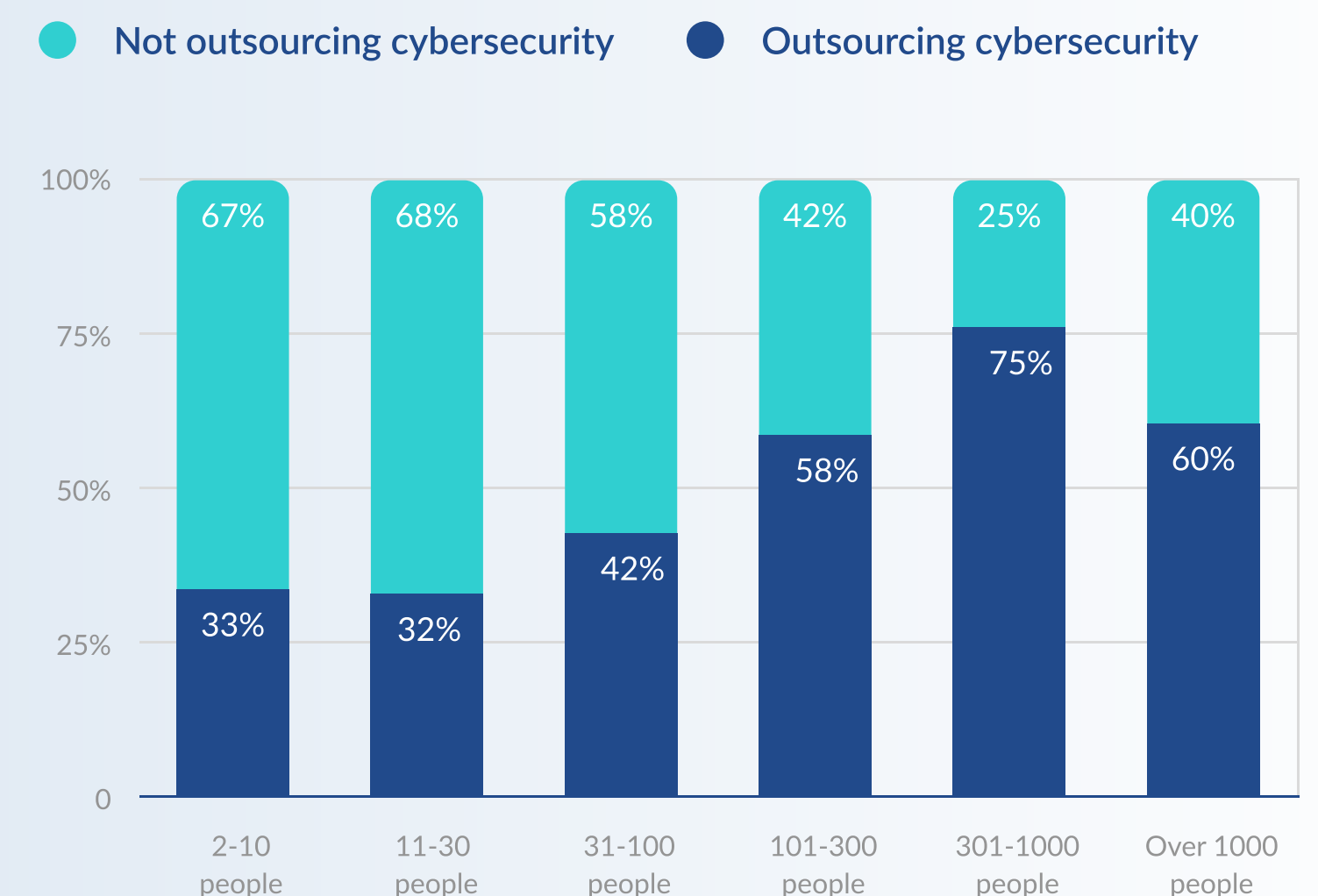
Outsourcing cybersecurity seems to be the more popular choice among our respondents compared to dedicated teams. **The majority of organizations with a headcount of 100 or more are tasking an external company with protecting their digital space.** One reason for this trend might be cost-effectiveness. Internal cybersecurity teams are expensive, especially taking into account the budgets at smaller companies.

Secondly, cybersecurity is a broad term. For specific security tasks, it might be better to hire an external company specializing in that particular subject. The third reason might be separating cybersecurity topics from the company structure. At the largest companies, cybersecurity departments report directly to the board. This is to avoid potential conflicts and undue influence on decisions resulting from the company structure.

Are you using the services of external specialized companies for security and cybersecurity?



Implementation of cybersecurity outsourcing by company size



GDPR is the most commonly enforced regulation

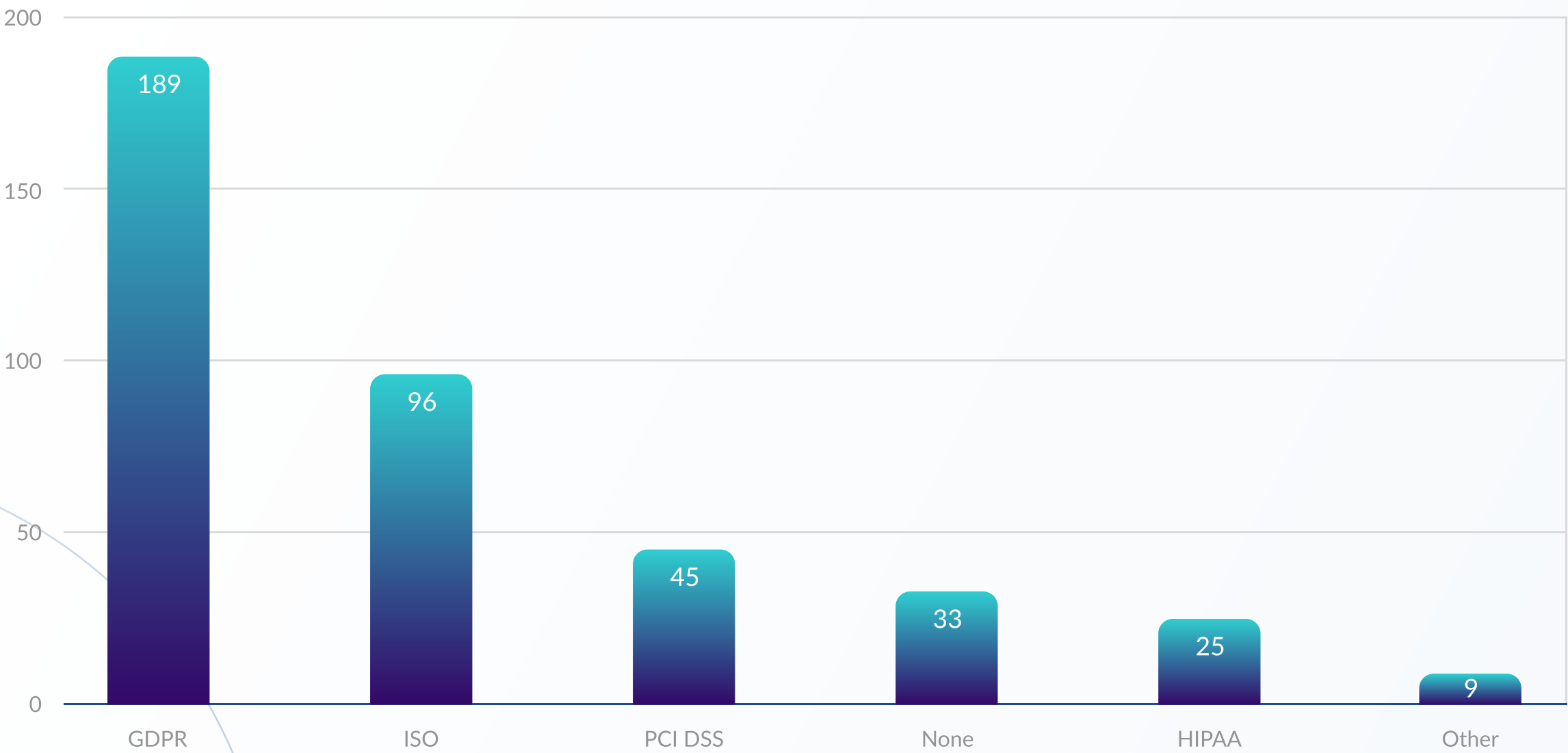
We asked respondents about whether they enforce one of the following regulation and standards: GDPR, ISO, PCI DSS, and HIPAA. GDPR was the only one enforced by a majority of respondents (74%). The runner-up was ISO, enforced by 38% of respondents.



Aleksander P. Czarnowski
CEO @ DEFENSELAYERS

While GDPR is a widely recognized security-related regulation, compliance with Article 25 privacy by default and privacy by design can be challenging without proper expert knowledge when building applications or microservices containers.

Which of the following standards and regulations do you enforce for the systems in your organization?



Multi-Factor Authentication is commonly adopted; SIEM is a rarity

Data security is an important technological concern for companies due to law regulations and the steep costs of a data security breach, both in terms of money and reputation. That’s why we decided to ask what security measures CTOs have adopted, and to what extent.

Over 75% of our respondents are using some manner of Identity and Access Management (IAM); nearly half have implemented it in most or all cases. Multi-Factor Authentication is the most popular tool to manage access, followed closely by Single Sign-On.

The outlier of the bunch is Security Information and Event Management (SIEM). 61% of our respondents don’t use it at all. Some of the reasons may be the high cost of tools such as Splunk or the relatively large effort required to feed SIEM tools the right logs and data so they can do their job.

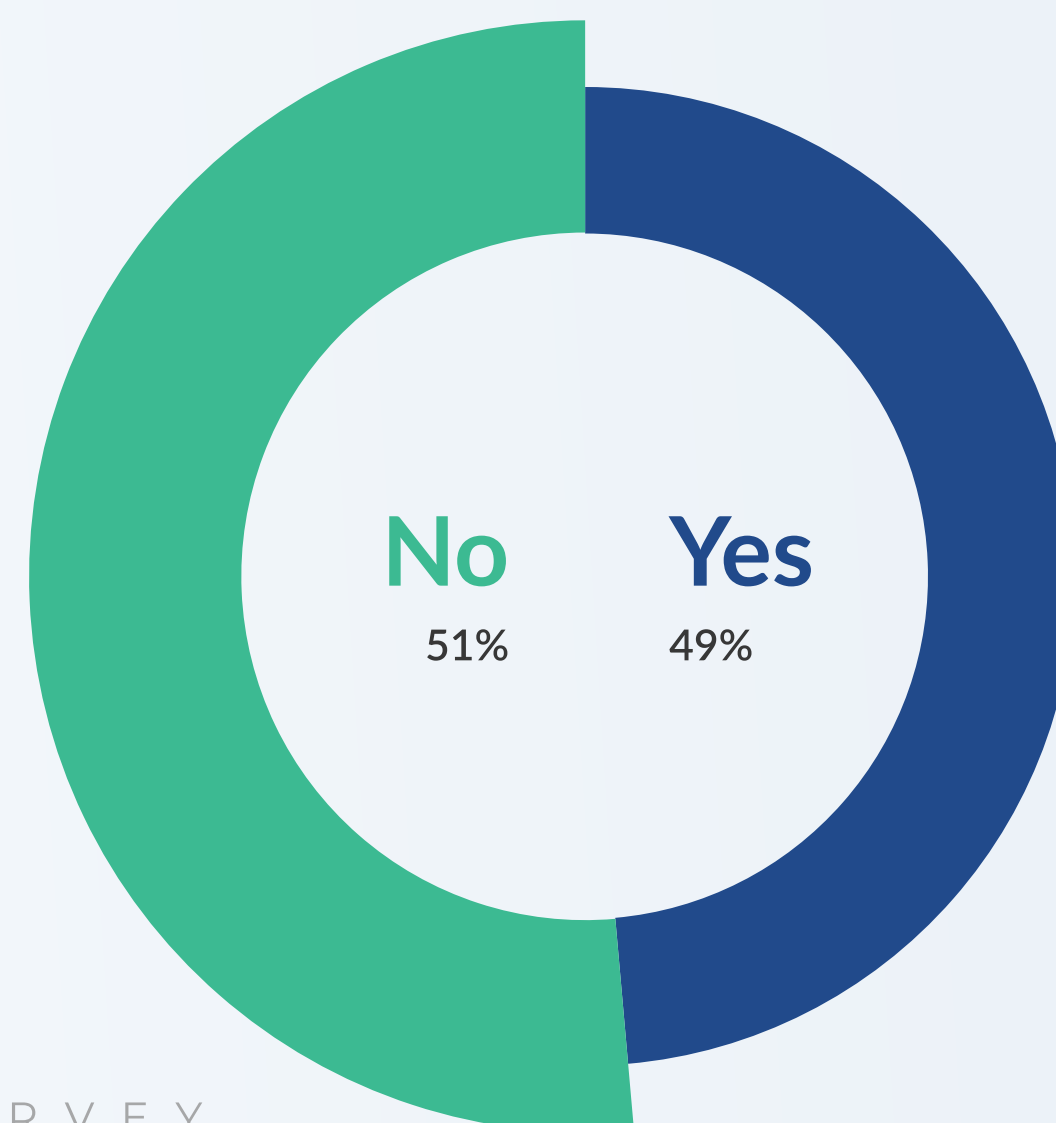
Adoption rate of security measures	Identity and Access Management (IAM)	Multi-Factor Authentication (MFA)	Single Sign-On (SSO)	Privileged Access Management (PAM)	Security Information and Event Management (SIEM)
Implemented everywhere	42	44	31	24	8
Implemented in most cases	73	60	53	36	19
Implemented in some cases	70	93	91	60	58
Not implemented at all	50	50	68	96	134

Bring Your Own Device: convenient for employees, security concern for the C-level

Roughly half of our respondents allow their teams to use their own devices for work. For the most part, CTOs take the additional security threat seriously: the overall adoption rate of security tools was higher in companies with Bring Your Own Device policies in place.

Still, **13% of our respondents have a BYOD policy and yet don't even use Multi-Factor Authentication.**

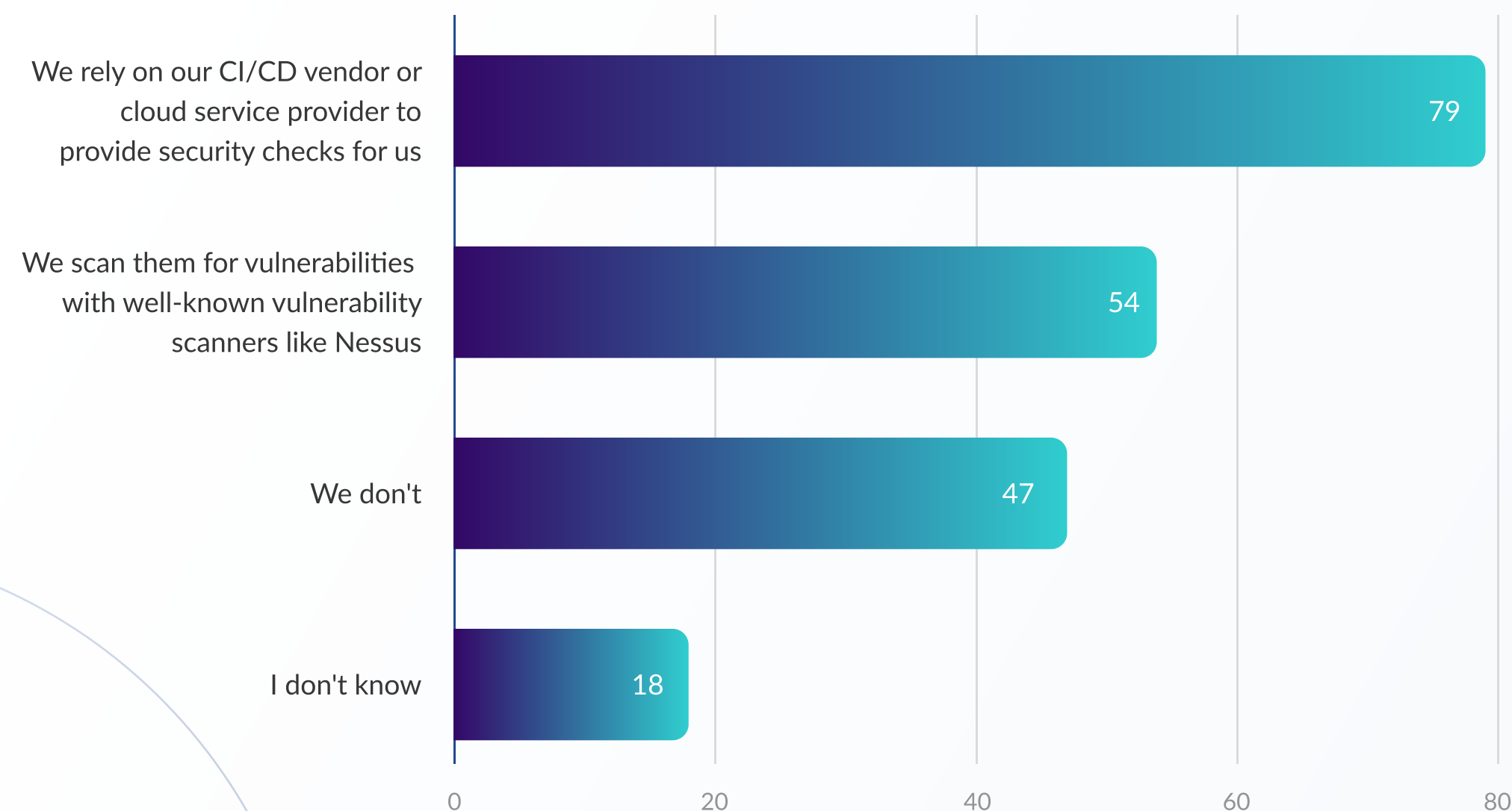
Do you have a Bring Your Own Device policy in place?



Most respondents check the security of their containers in some fashion

However, most respondents don't have special guidelines for container security. Most typically, they rely on their CI/CD vendor or cloud service provider to provide security checks for them.

How do you check the security of your containers?



Aleksander P. Czarnowski

CEO @ DEFENSELAYERS

While the container ecosystem is blooming, it still doesn't meet one basic security requirement: proper trust management. Without trust, any security system known to humanity must fail instantly. Since over a half of the respondents don't have specific guidelines to check the security of their containers, it poses a huge risk to their business. Imagine what would happen if a malware or backdoor installed in a container was to be uploaded to a customer production environment.

04 Management & hiring

How are CTOs
helping their teams
grow?

When assessing their teams' performance,

CTOs typically consider Agile metrics, quality of deliverables, and feedback from peers on soft skills

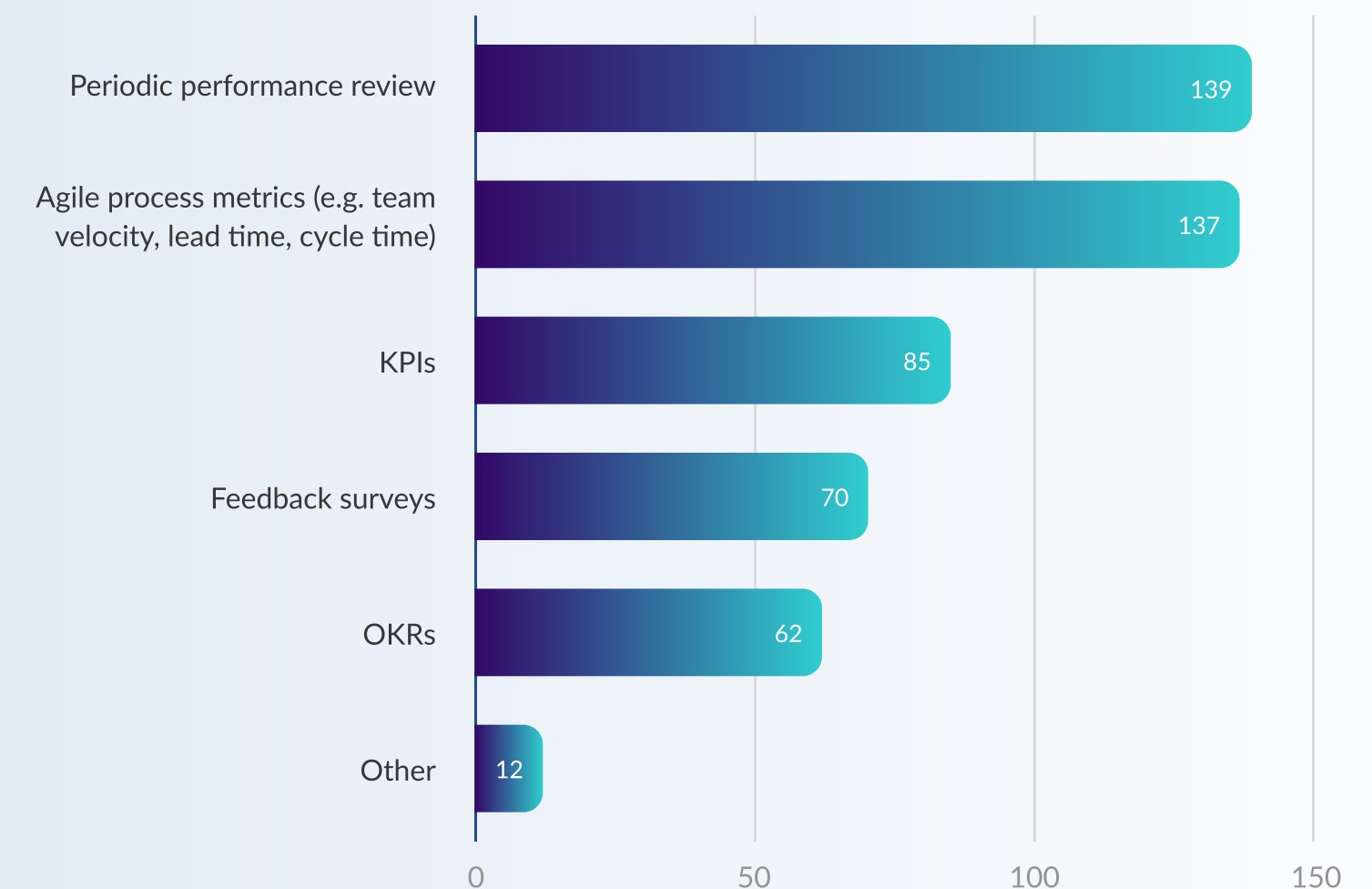
CTOs need to keep tabs on how well their teams are delivering what's expected of them. We asked our respondents what tools they use to assess their teams, and what they take into account when evaluating the performance of individual team members.

The results show that the typical CTO will perform periodic performance reviews and monitor Agile metrics like team velocity and lead time. Roughly a third of our respondents use KPIs.

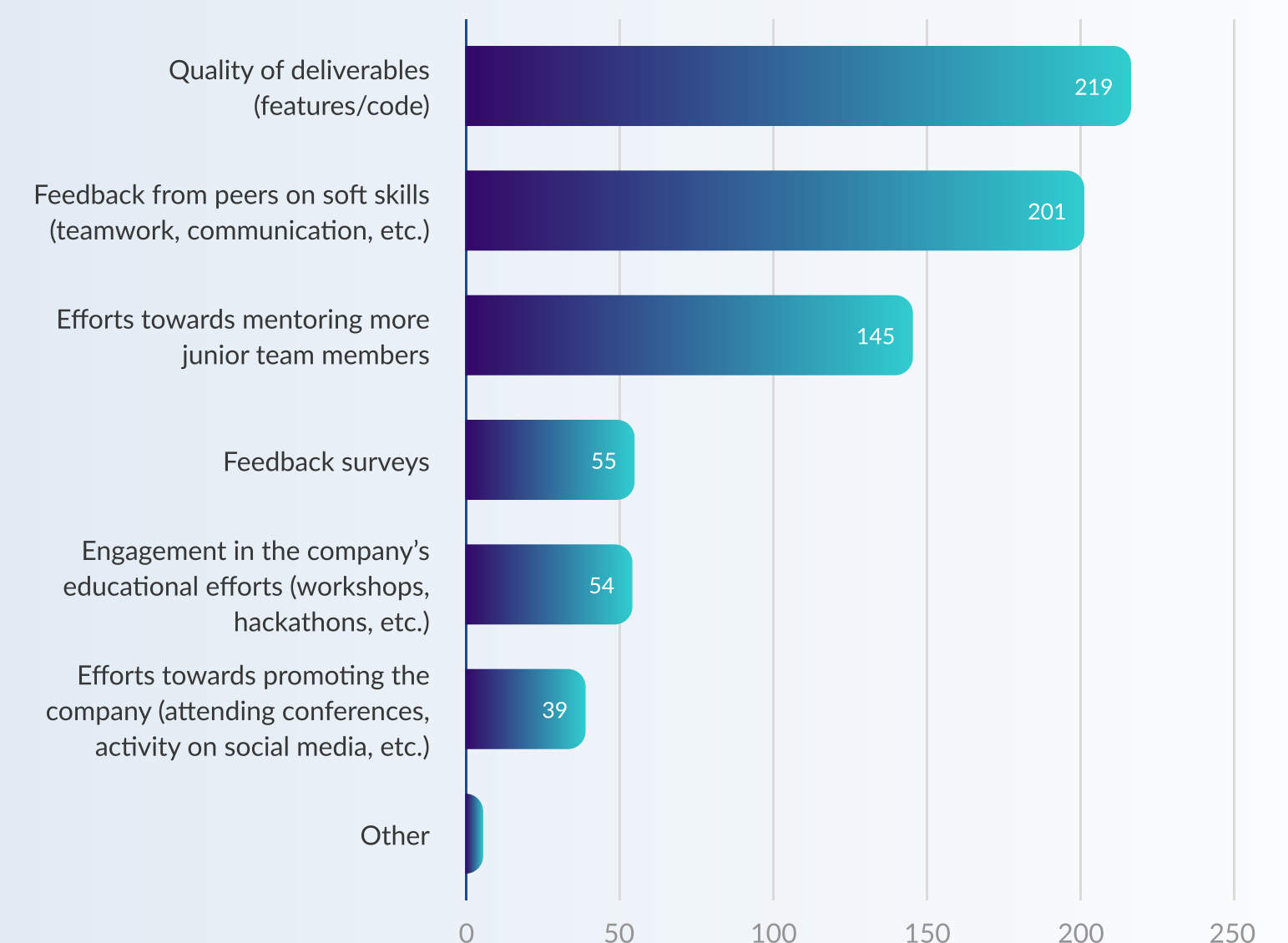
Team members looking to impress their CTOs are facing a balancing act: quality of deliverables and code is the #1 criterion for their assessment, but it's closely followed by feedback from peers about their soft skills. Efforts towards mentoring more junior team members also won't go unnoticed.

In short, CTOs reward team members who can code, communicate, and teach others. But they don't pay that much attention to engagement in hackathons, conferences, or on social media.

How do you measure your team's performance?



Which of the following influence your assessment of team members' performance?



Scrum reigns supreme among software development frameworks

It's safe to say that Agile development is the dominant way of building software in 2020. 77% of our CTO respondents use Scrum; 51% use Kanban.

Meanwhile, the popularity of Waterfall development is at a measly 12%—with the notable exception of corporations. **60% of corporate CTOs who responded to our survey still develop software the Waterfall way.** However, more often than not they are also using Scrum alongside Waterfall, presumably adapting the choice of development framework for the project at hand.

What software development frameworks do your teams use?



1 in 4 CTOs doesn't use any project management framework

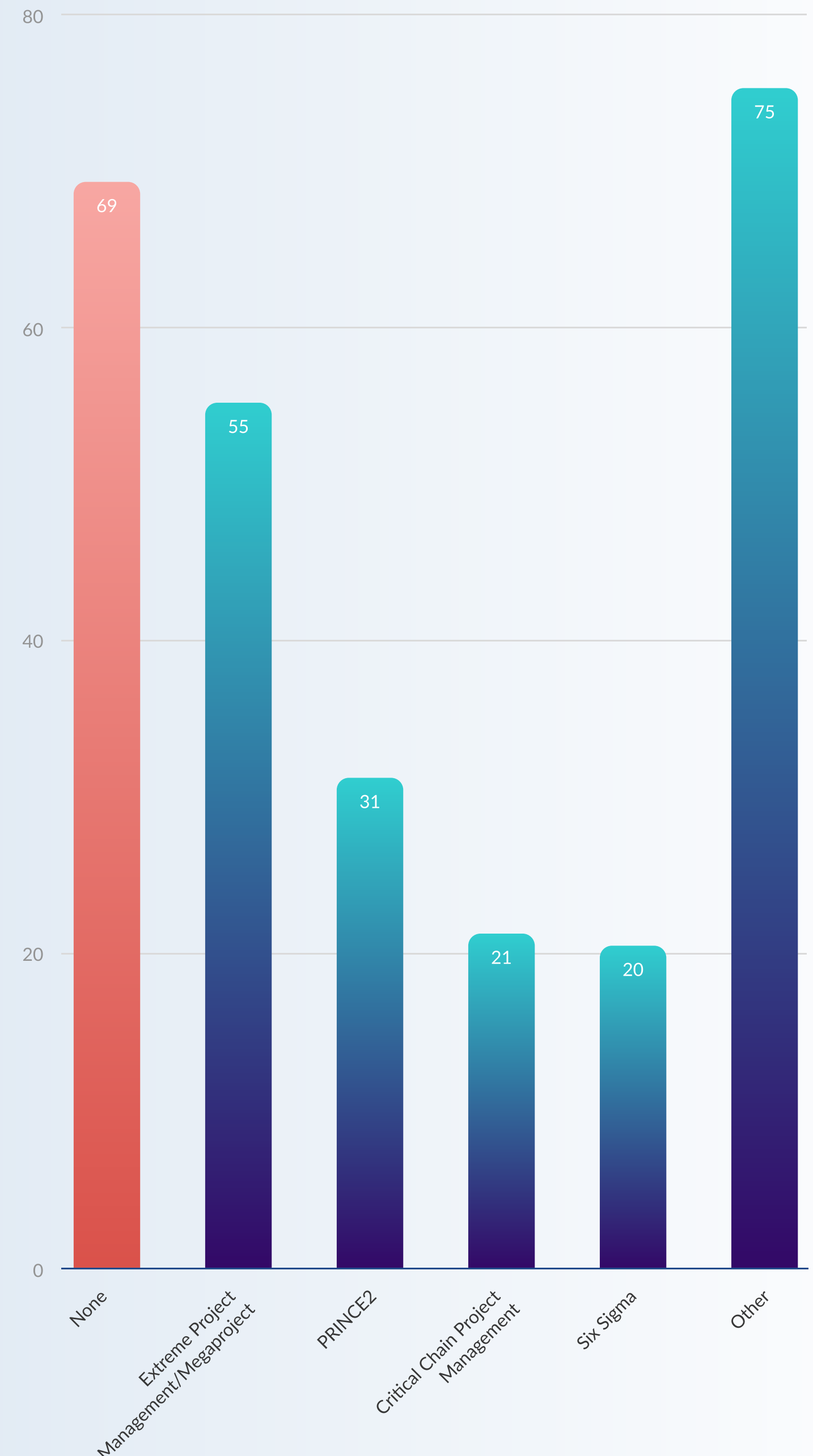
While CTOs use software development frameworks a vast majority of the time, frameworks for project management are much less popular. 27% of CTOs don't use one at all.

The frameworks that do see some use tell an interesting story. The top choice, **Extreme Project Management**, is a perfect fit for chaotic projects where development is fast, there's a lot of uncertainty, and changes during the project happen very often. Its popularity among CTOs shows that they often have to deal with extremely volatile projects.

The second most popular pick was **PRINCE2**, which puts a lot of emphasis on a strict structure of roles and responsibilities. It's easy to imagine an overwhelmed CTO (especially in a larger organization) applying it to introduce some order to the multitude of projects in flight.

Note: a lot of the responses under "Other" included answers that were difficult to categorize as project management frameworks, such as "Agile" or "Jira".

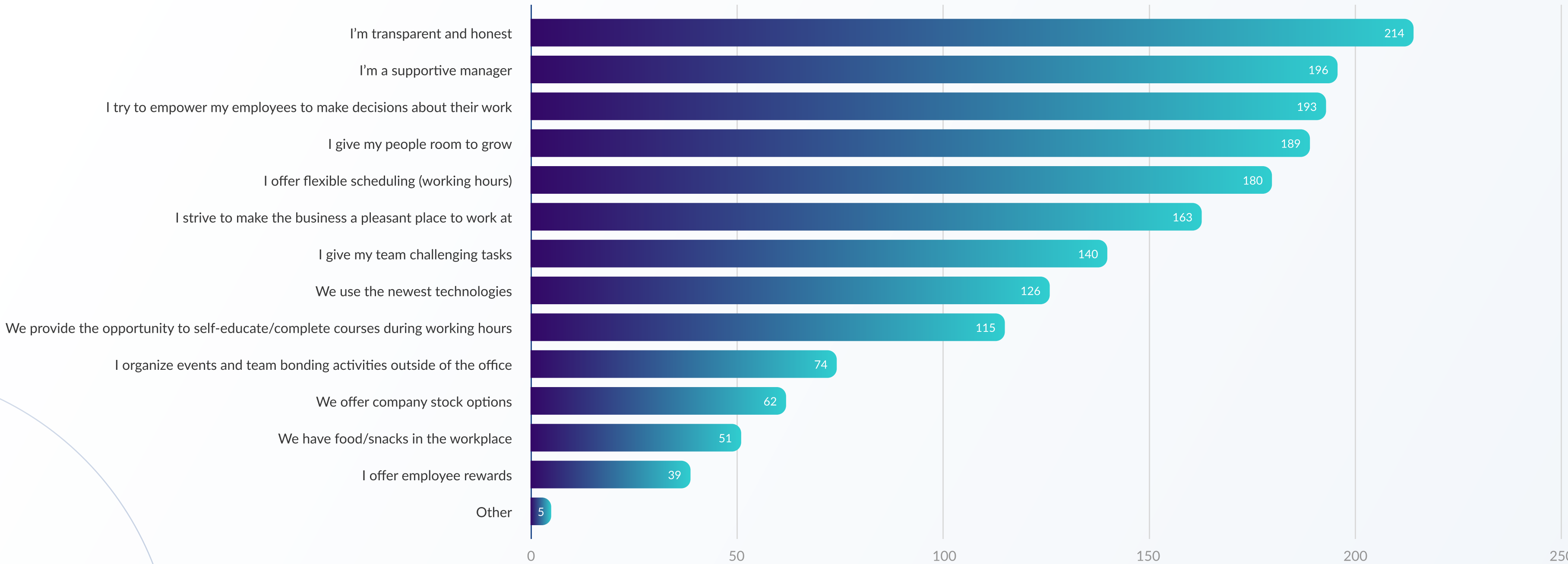
What project management frameworks do your teams use?



To motivate their employees, CTOs bet on transparency, honesty, and being supportive

We asked CTOs how they motivate the employees. For this question, they could choose as many answers as they wanted. The picture that emerges from the answers paints CTOs as leaders who like to keep an open line of communication and help their teams grow by giving them responsibility and decisionmaking power. On the flipside, CTOs don't see value in material rewards, snacks, company stock options, and even team bonding activities. It's also interesting to note that by their own admission, **roughly half of the respondents don't think that their tech stack is modern enough to excite their employees.**

How do you keep your staff motivated?



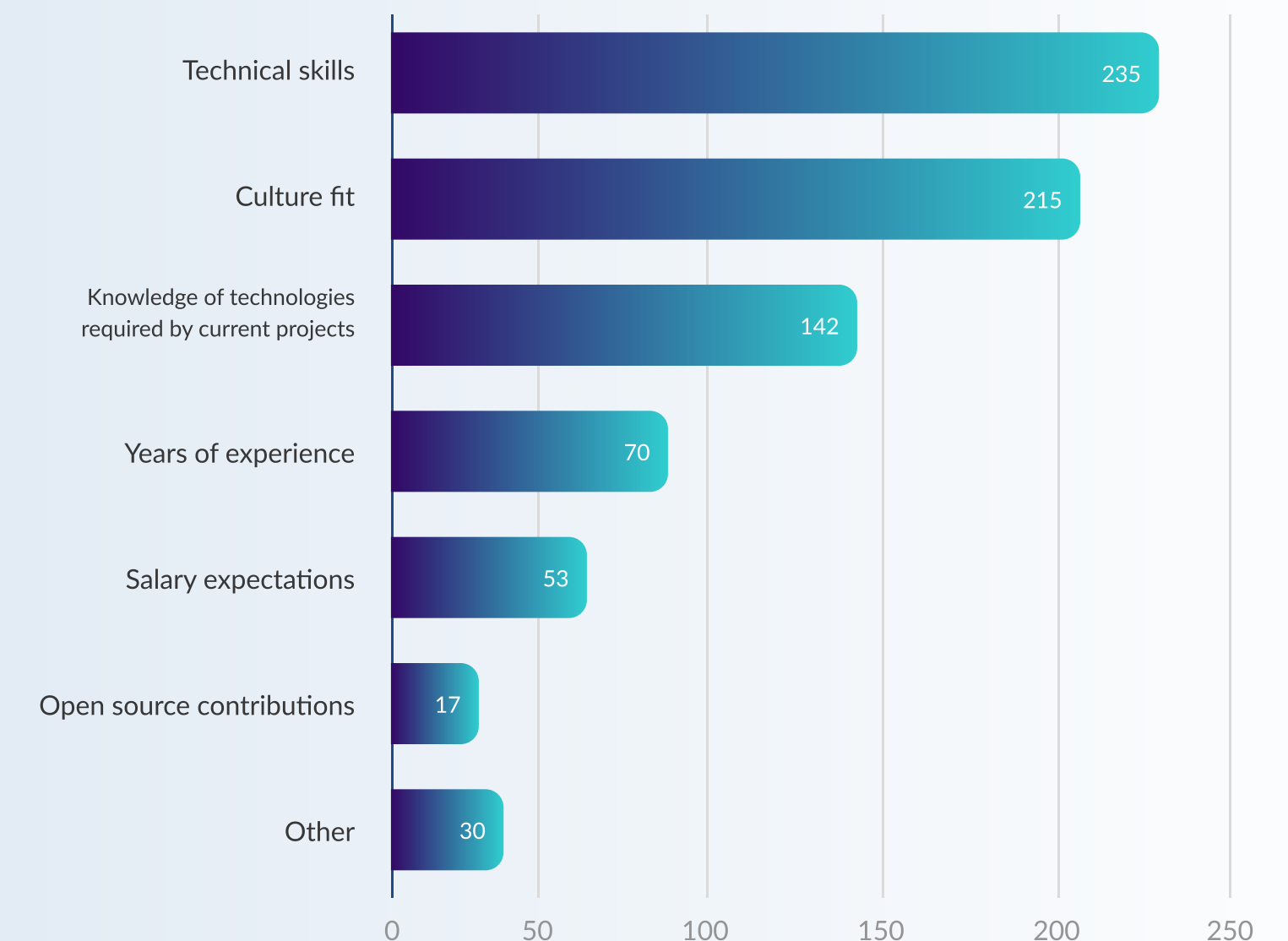
Hiring: employee referrals, direct search and job ads find the best candidates

When recruiting, CTOs pay attention to technical skills, culture fit, and the candidates' knowledge of the technologies currently in use in the CTOs' projects. Years of experience and salary expectations are much less important, and only a handful of our respondents pay attention to open source contributions.

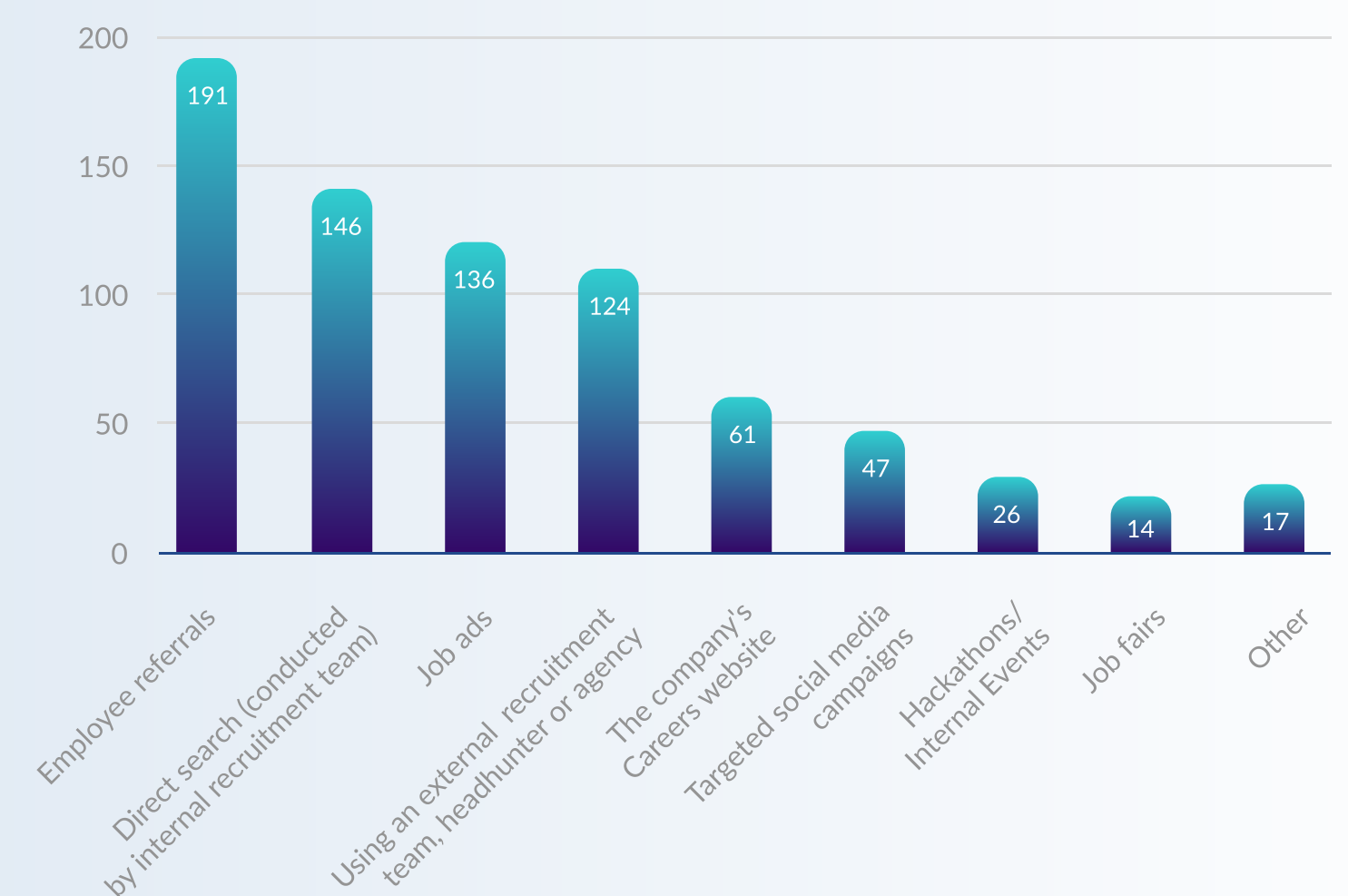
Hiring great developers is one of CTOs' major challenges, which is why we asked which tactics are working for them in 2020. To ensure a healthy pipeline of promising candidates, **CTOs should focus on employee referral programs, building out an internal recruitment team, and posting job ads.** Failing that, external recruitment teams and headhunters are not far behind in terms of efficiency.

On the other hand, targeted social media campaigns and hackathons are usually inefficient in our respondents' estimation.

What are your most important hiring criteria?



What's your most efficient method to hire talent?



Expert commentary

“People assume job boards and ads have been dead for a while now. Meanwhile, we can see them in the top 3 most efficient talent sourcing methods. I'm not surprised at all. Developers want relevant job offers and industry-specific job boards like Just Join IT deliver exactly that. We've been building an engaged community within the IT industry that attracts 200,000 tech professionals in Poland alone. That's an enormous and still growing talent pool that companies and CTOs can tap into.

Piotr Nowosielski

CEO @ JUST JOIN IT

Just Join IT is a go-to job board for technology professionals in Poland and worldwide, creating a link between amazing companies and great talents.



05 Challenges

What obstacles are
CTOs trying to
overcome?

The tech challenges CTOs are facing —in their own words

We asked our respondents an open question about the biggest challenges they see themselves facing in the next 2 years. This is a word cloud based on their responses; the larger a word or phrase, the more often it was mentioned in the CTOs' answers.

The two technologies at the top of CTOs' minds come as no surprise: machine learning and artificial intelligence. Other solutions that were mentioned often include cloud technologies, data science, and microservices.

Some of the most prominent phrases in the cloud show the inherent tension in the CTO role. On the one hand, they want to constantly scale their product and ensure the growth of the company.

On the other, security is just as important.

It would also seem that CTOs are much more keen to look forward than back. You can see that by comparing the importance of scaling versus managing legacy code and technical debt. The latter are very much lost in the crowd of other smaller concerns.



What do you think is the single biggest technology challenge your company will need to overcome in the next 2 years?

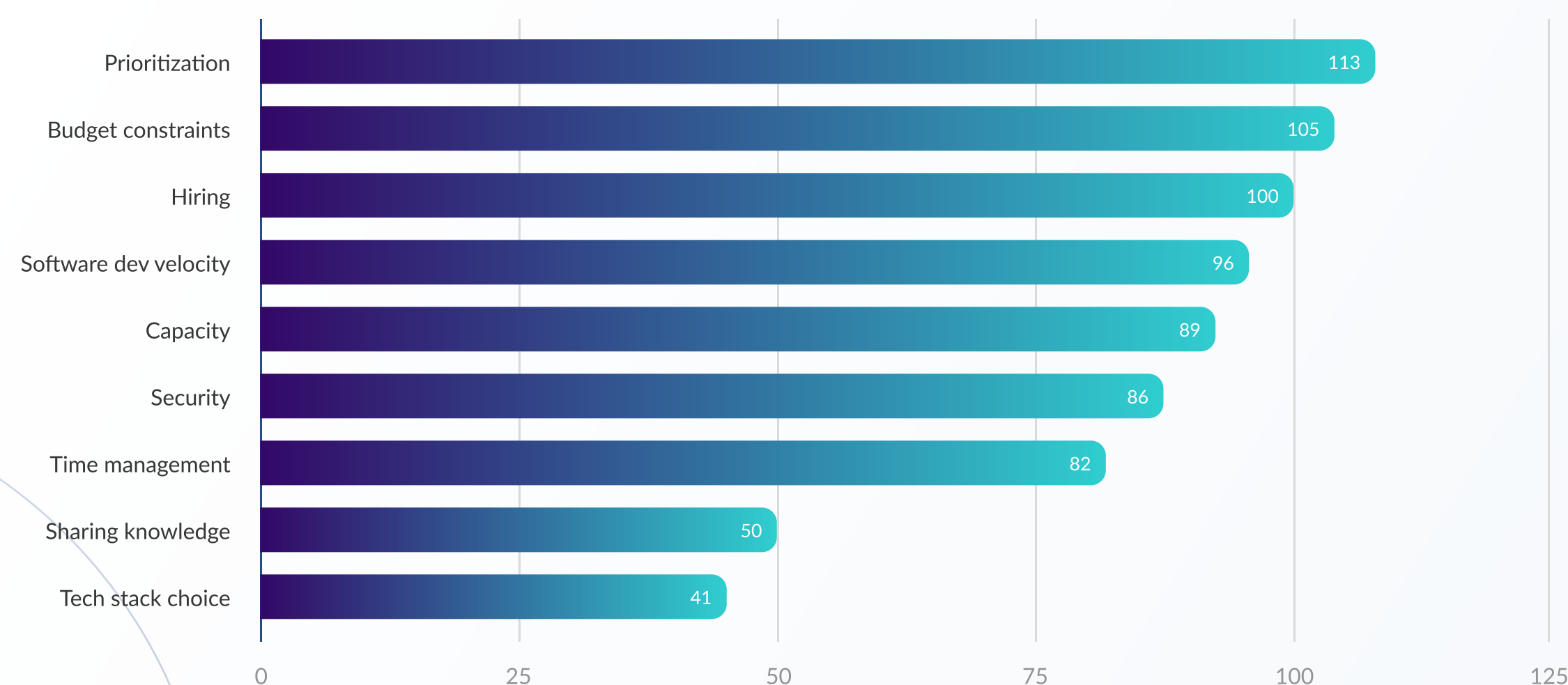
CTOs' main challenges: choosing what to focus on, and finding the budget and people to do it

The #1 challenge for CTOs indicated in our survey was prioritization. The possibilities offered by today's technological landscape are vast, and CTOs are constantly asking themselves which pies they should get their fingers into.

After that, most of the top challenges relate to delivering the product in one way or another: either having the money to do it (budget constraints), finding the talent (hiring), or delivering it on time (velocity).

On a positive note, CTOs aren't losing sleep over their tech stack choice, or at least it's not their biggest concern at the moment.

What is your biggest challenge in software development?



CTOs' top 3 priorities



06 Self-education

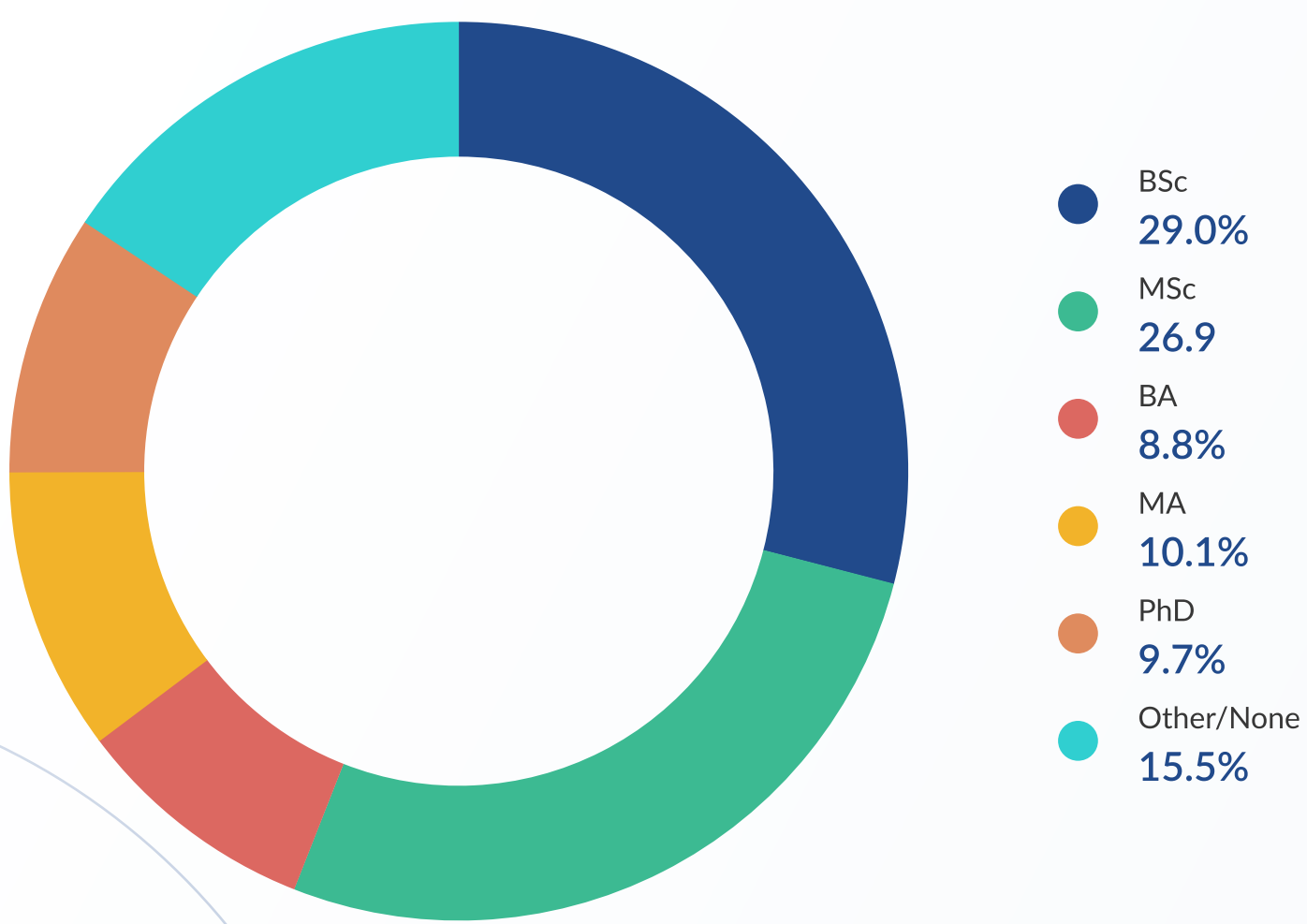
How are CTOs
growing their skills?

70% of the respondents have formal education in software engineering

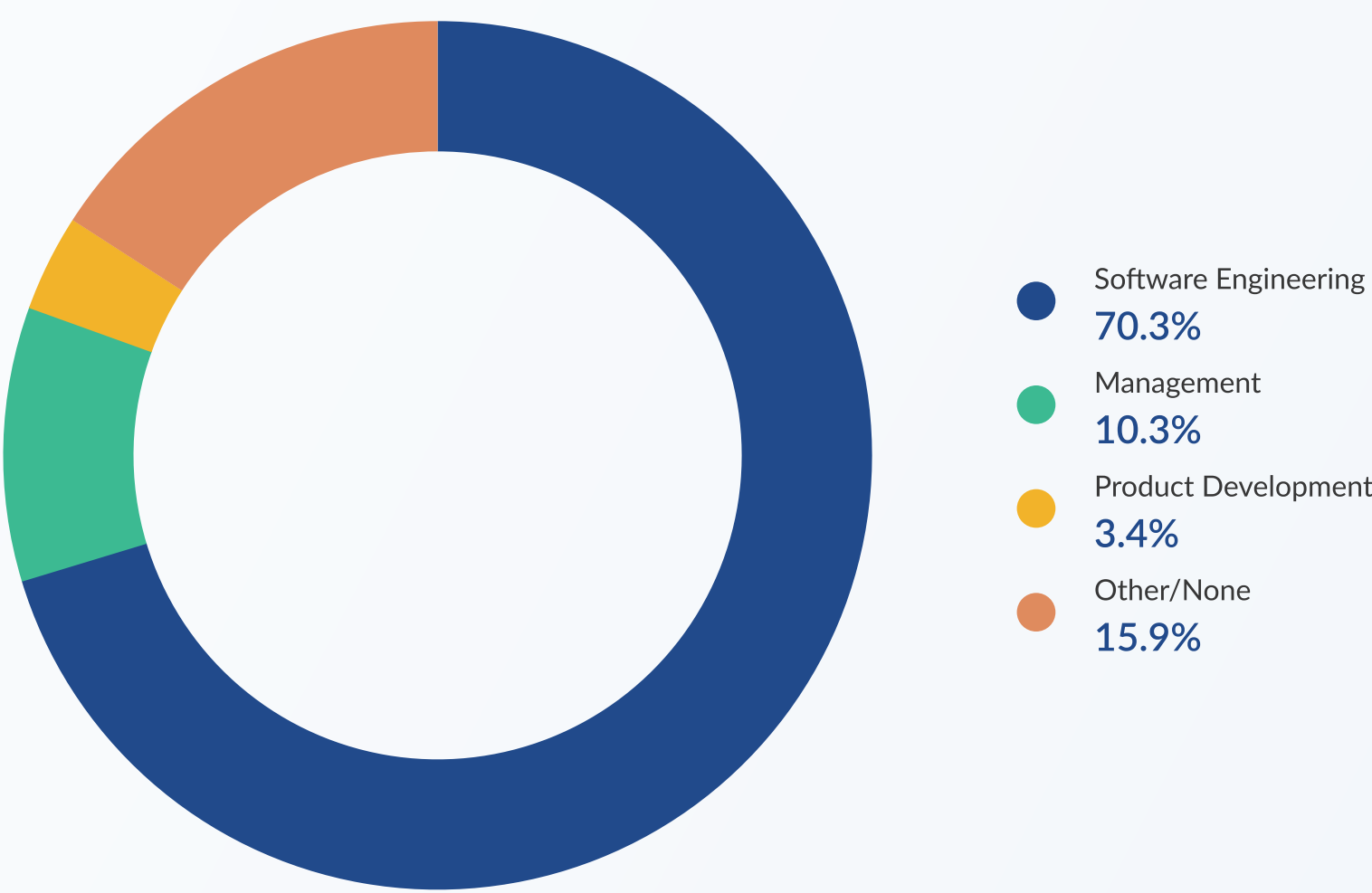
Only 10% of survey respondents had formal education in Management. 56% of respondents hold titles of either BSc or MSc.

The results seem to indicate that focusing on technical chops will get you further on the road to becoming a CTO.

CTOs' education and titles



CTO's fields of qualification



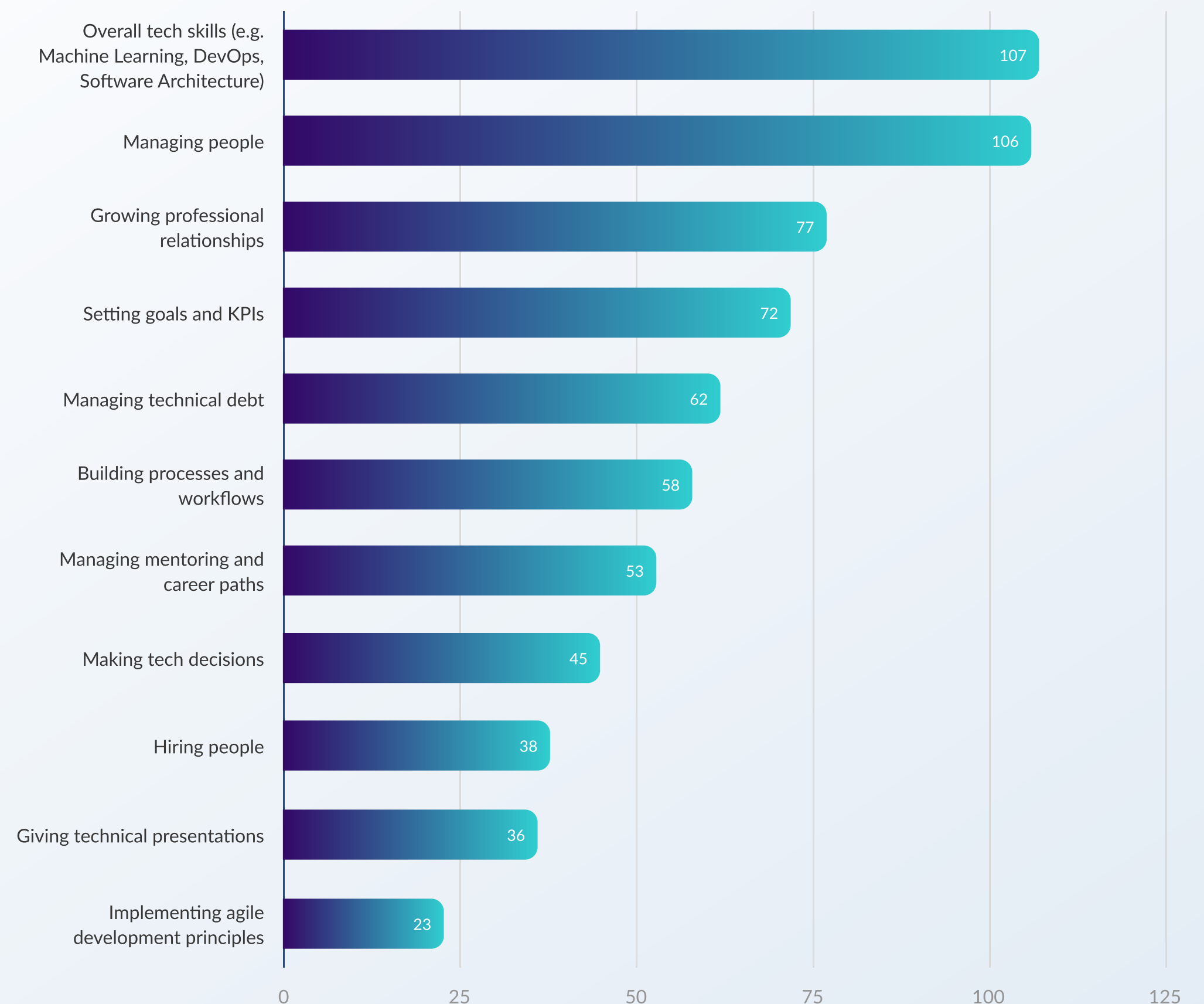
Areas of improvement: CTOs want to grow their core skills first

When asked about the skills they want to improve in their work, CTOs primarily indicated two areas: **overall tech skills and managing people**. One could say these form the “backbone” of the CTO role.

Aside from these two core competencies, CTOs also want to get better at growing professional relationships, setting goals and KPIs, managing technical debt, and building processes and workflows. The fact that each of these skills could be called an entire discipline in itself illustrates the breadth of work that the CTO is involved in.

The least popular answers could be interpreted as areas where CTOs feel confident about their abilities. Such areas include implementing Agile principles and giving technical presentations.

Which of the following areas would you like to improve the most in?

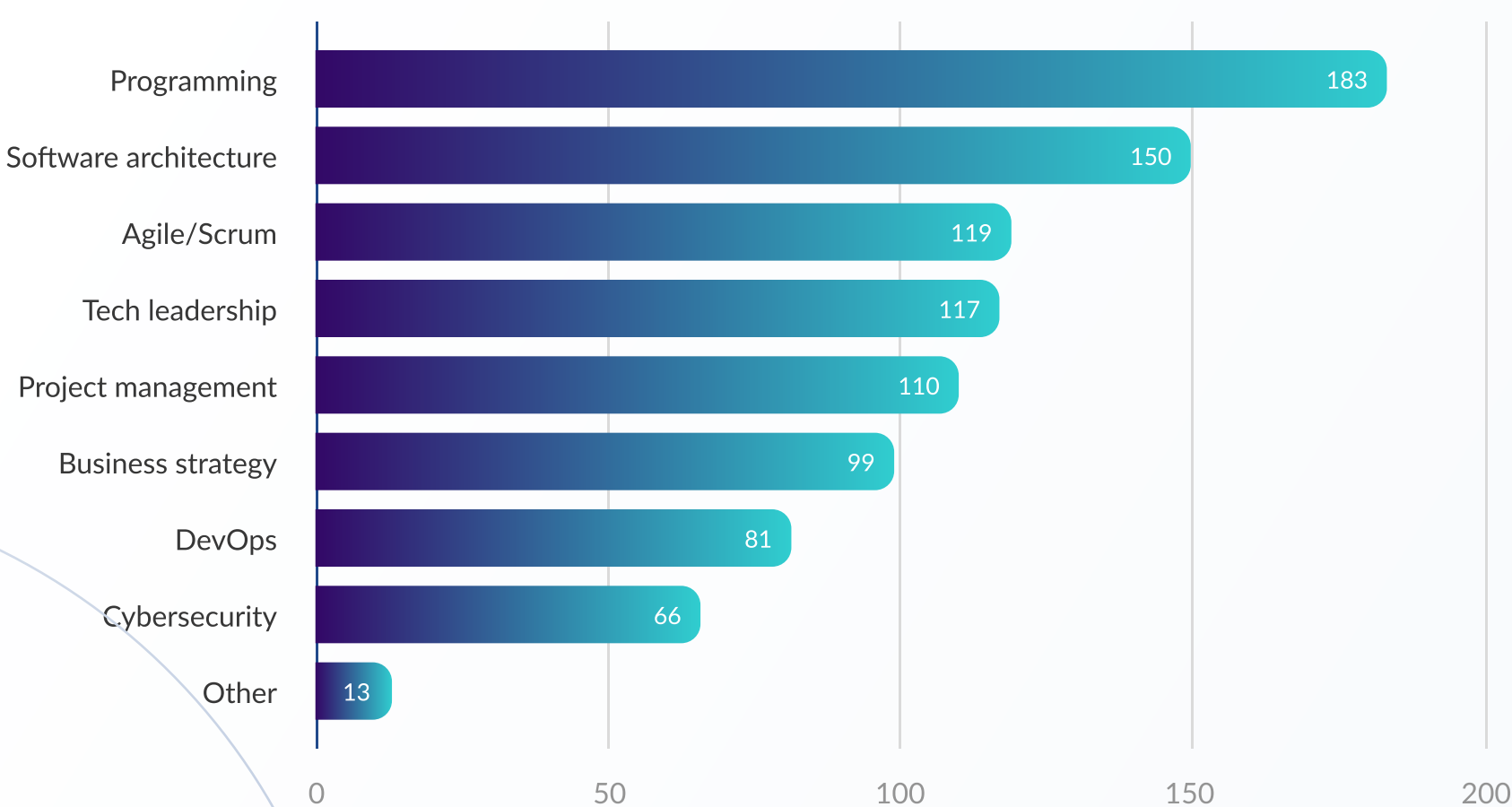


CTOs see value in continued learning

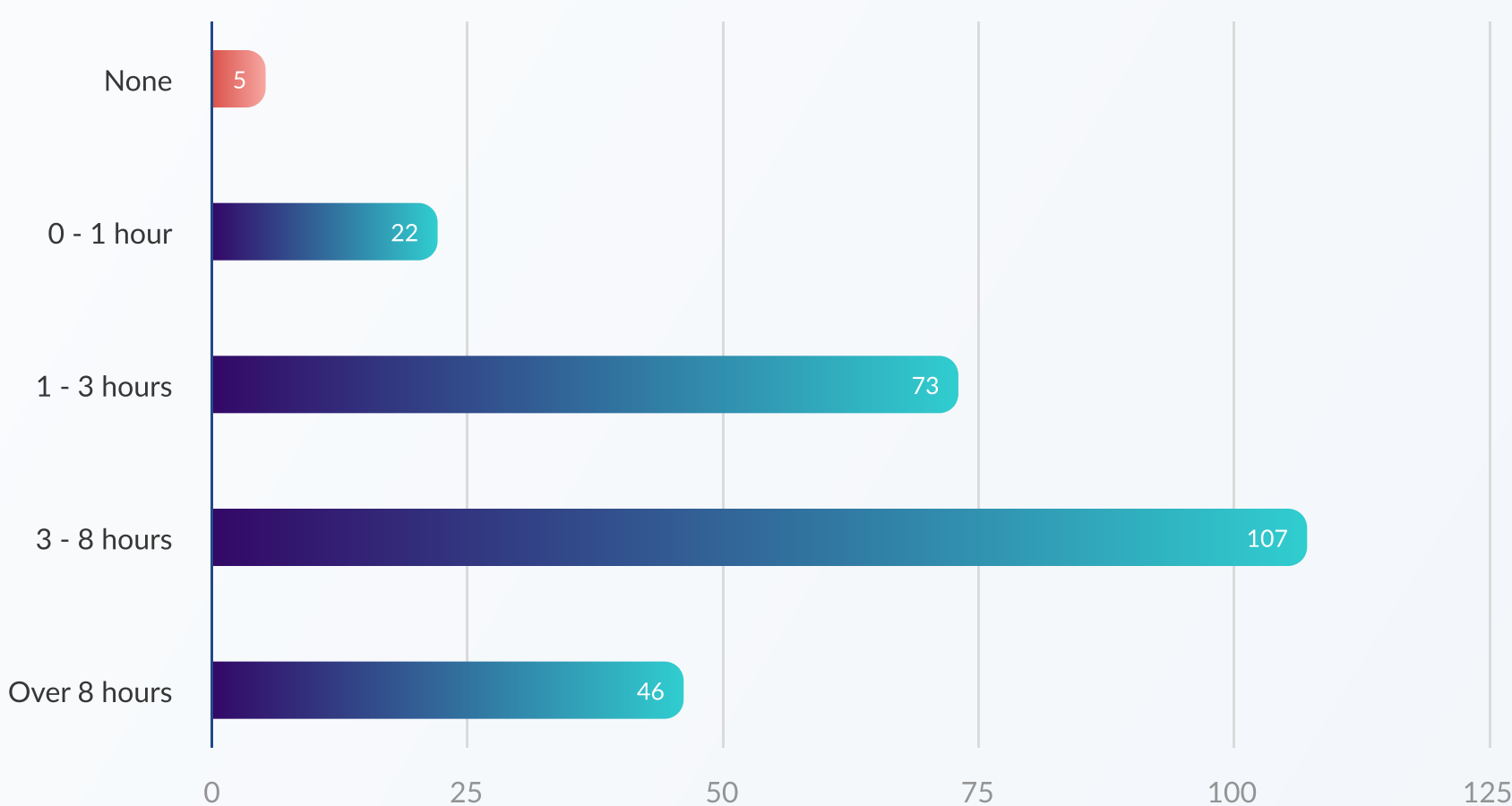
60% of respondents spend 3 hours or more on educating themselves. 18% spend over 8 hours on self-education.

Programming, software architecture and Agile/Scrum are among the most popular disciplines in which CTOs seek additional education. On the other hand, it seems that cybersecurity is not on CTOs' minds; only 26% of our respondents have taken a cybersecurity course.

What courses have you finished?



How much time do you spend on learning weekly?

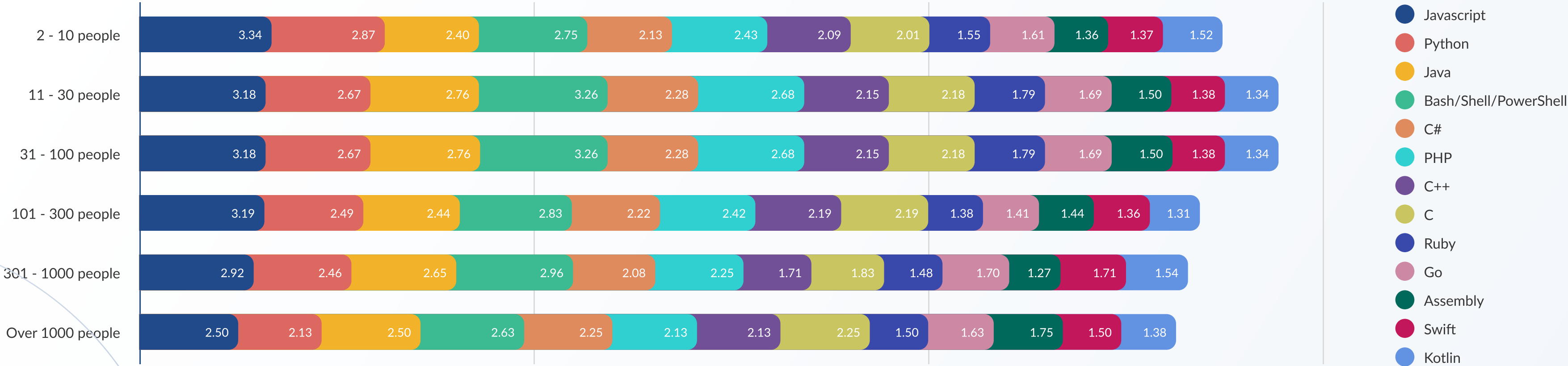


CTOs' tech skills are sharper in smaller companies

“Should CTOs code?” is a common dilemma in the technology world. We decided to explore it by asking our respondents about their personal programming chops. They were asked to assess their skills in several languages from 1 to 5.

Our results show that JS, Python, and Bash/Shell/PowerShell are the programming languages most commonly known among CTOs. One interesting find is that CTOs from companies up to 100 people assess their language knowledge higher than CTOs from bigger companies. This probably relates to the fact that in smaller companies, CTOs are sometimes called upon to do some of the coding themselves—so they need to keep their coding skills sharp by necessity.

On a scale of 1-5, how skilled do you consider yourself at the following languages?



The key skills for a CTO: balancing tech, business, and people

We asked our respondents an open question about the most important skills CTOs need to succeed. This is a word cloud based on their responses; the larger a word or phrase, the more often it was mentioned in the CTOs' answers.

It's clear that the CTO has a lot on their plate. **The responses very often focused on the balancing act between the business, the technology it uses, and the people who get work done.**

A big part of the story is told by the verbs in the cloud. CTOs are focusing not just on hiring, building teams, and managing them; they are also translating information between the domains of tech and business.

In the end, two of the most prominent words encapsulate the CTO role: communication and leadership. Being a CTO is all about ensuring the flow of information between the many different domains that they touch, and pointing the direction forward.



What is the most important skill for a successful CTO, in your opinion?

Expert commentary

“CTOs’ knowledge, experience, and leadership style impact the rest of their organization. It’s not surprising that most CTOs identify improving their technical skills as top priority. Technical leaders face the need to improve their skills while having only a few hours per week to invest in their personal development and learning. This is hardly enough to both identify the right resources to learn from and thoughtfully consume them. We see our students in software engineering, machine learning and cybersecurity solving this challenge through learning 100% online at a flexible pace, learning these critical new skills in 6 to 9 months.



Jonathan Heyne

VP, GM OF DATA & ENG. PROGRAMS @ SPRINGBOARD

07 Job satisfaction

How satisfied are
CTOs with their jobs?

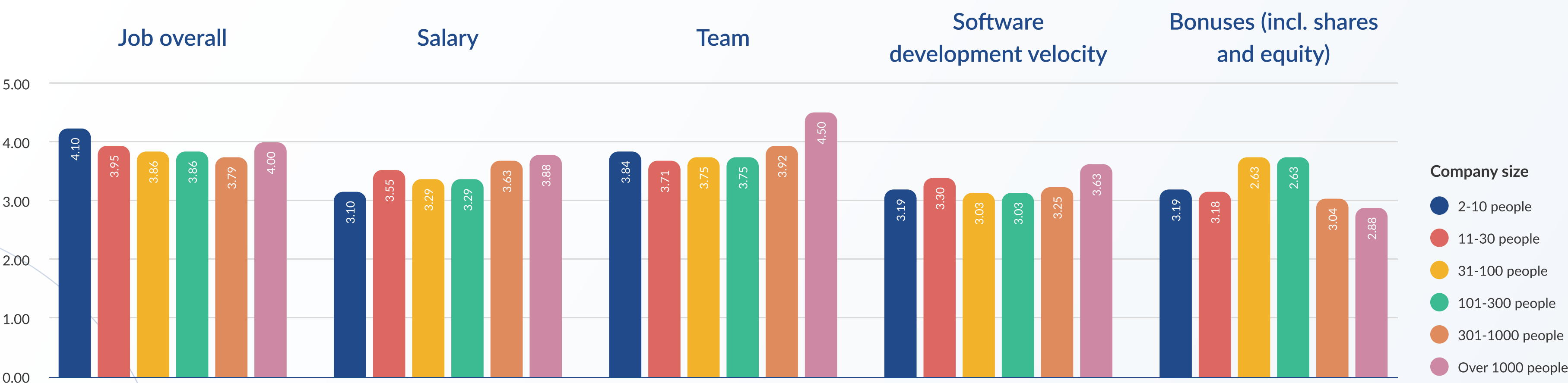
CTOs tend to be satisfied with their job overall

The average for job satisfaction was 3.94 out of 5.

Our data indicates that CTOs are the happiest either in small companies or very large organizations with over 1000 people. CTOs at medium-sized companies are not only less satisfied with their job overall, but also the least satisfied with their software development velocity. This could be attributed to the “growing pains” of SMEs, where headcount and complexity are already high, but no processes have been implemented yet to ensure smooth software development.

The bigger the company, the more satisfied CTOs are with their salaries. Executives looking to make their CTOs happier should look at bonuses, including shares and equity—our respondents indicate that’s the area with the most room for improvement.

How satisfied are you with your...



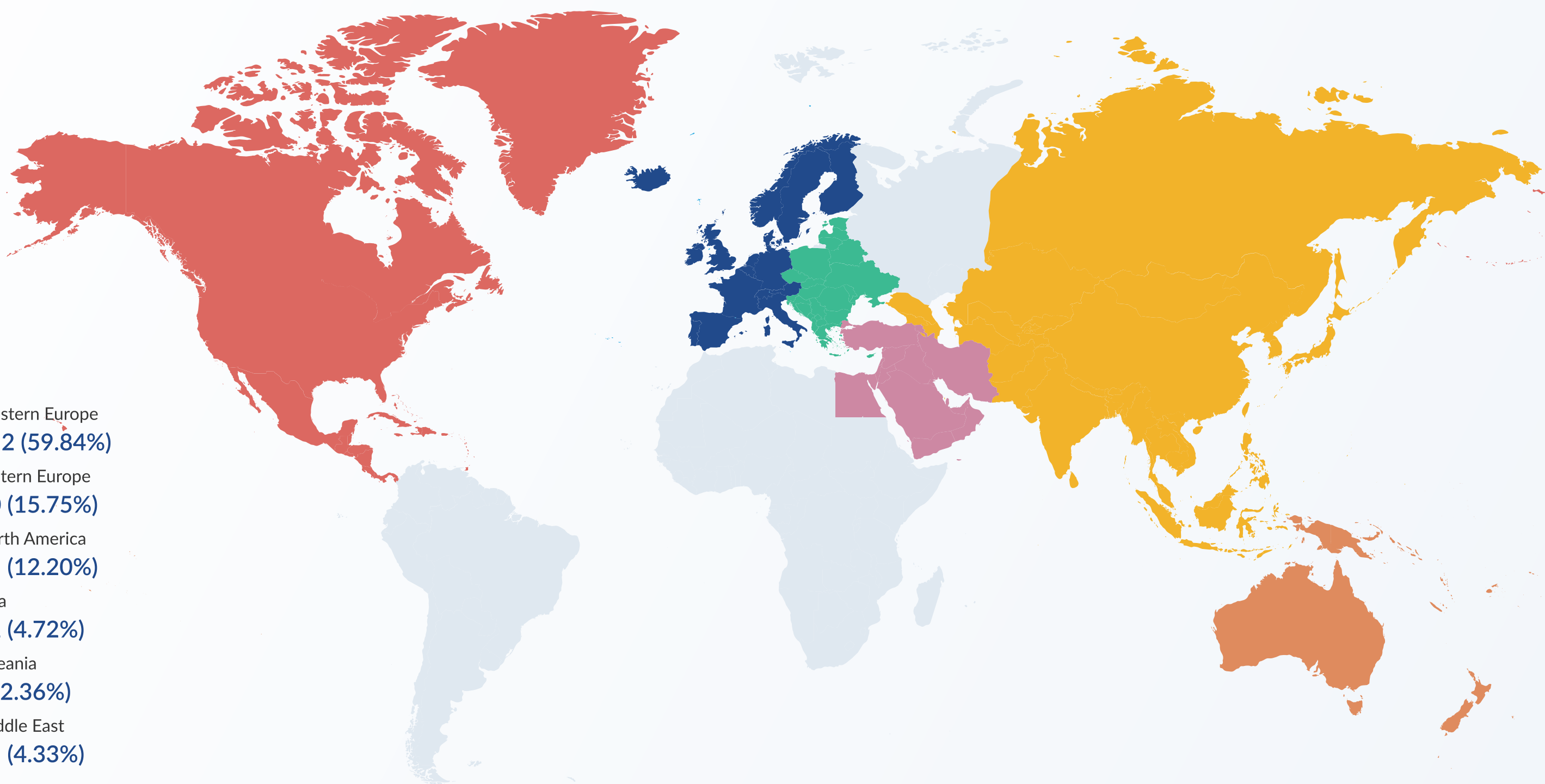
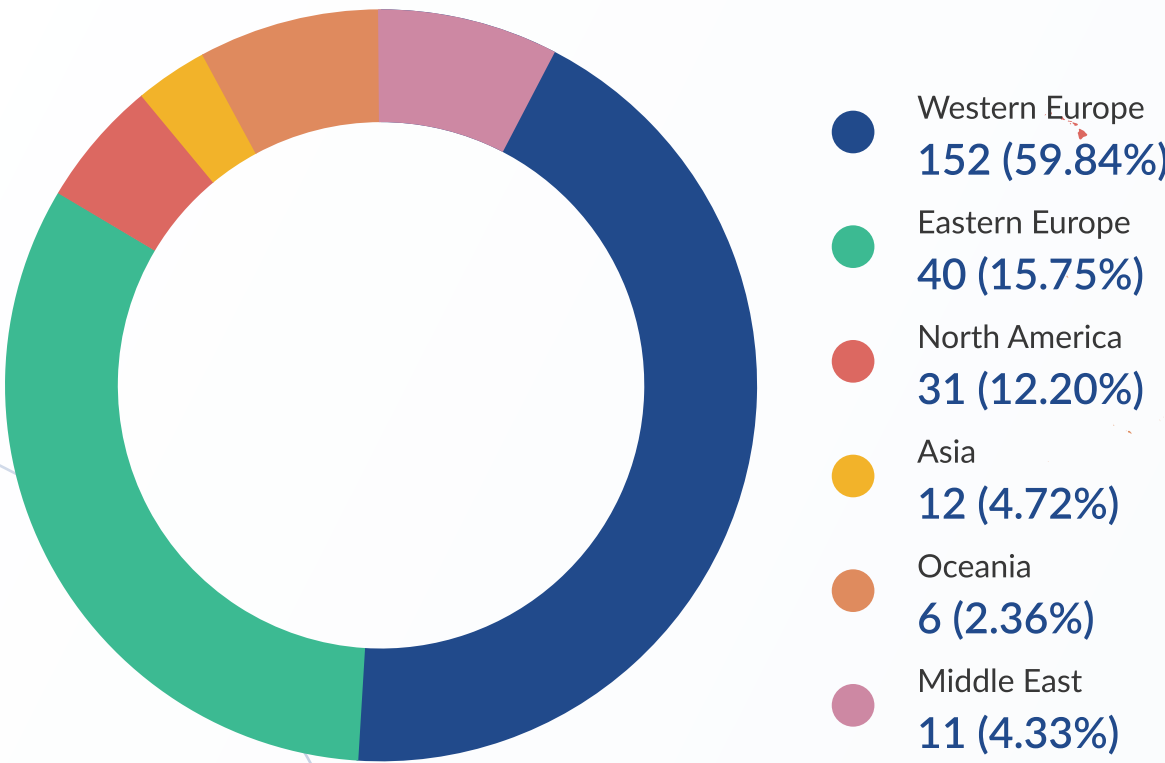
08 Demographics & firmographics

Who took part in our
survey?

Europe was the most represented region in this year's survey

CTOs from all over the world responded to our survey, but this year the majority of responses (76%) were from Europe, mainly Western Europe. The second most represented continent was North America.

Respondents by location

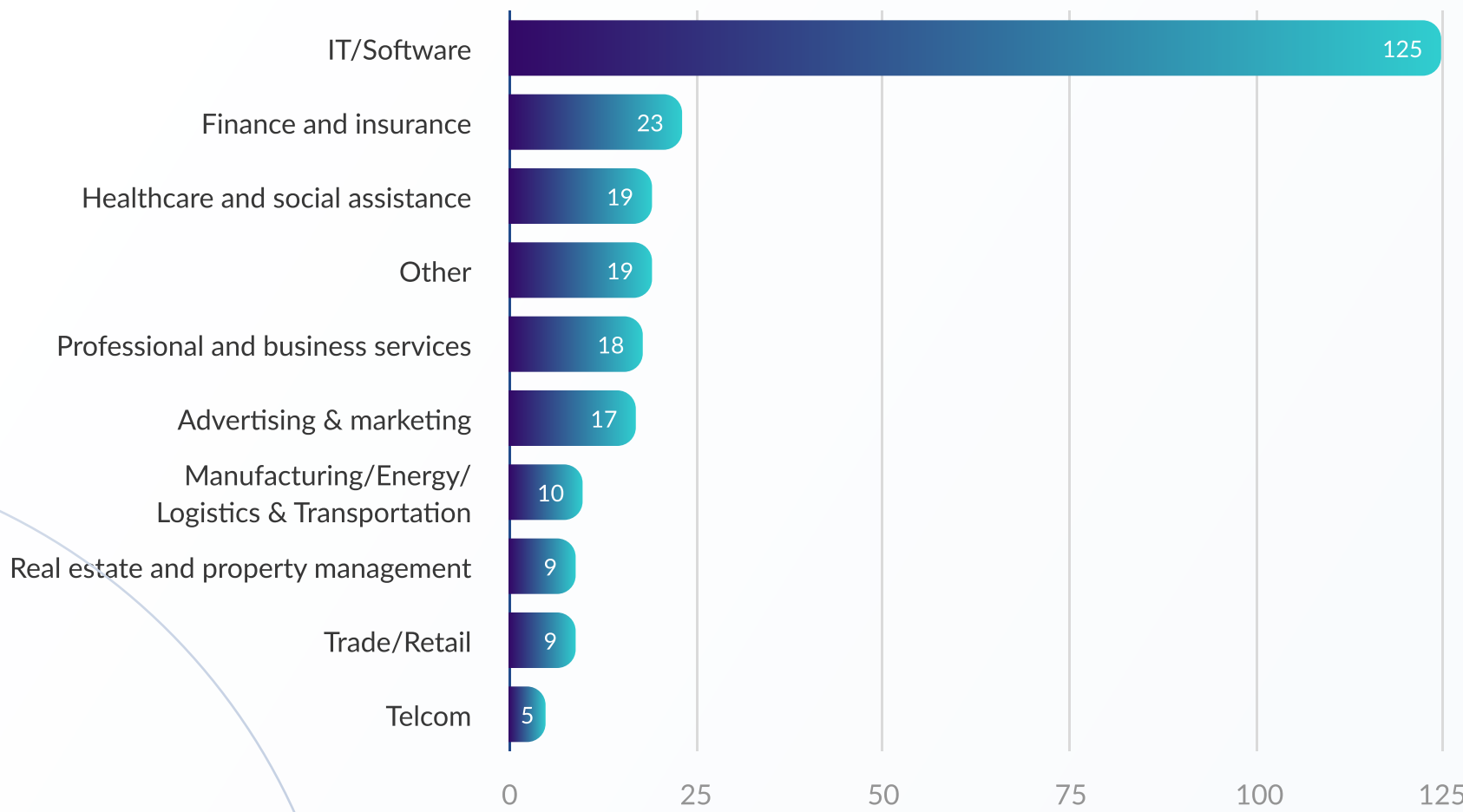


Our main group of respondents: software CTOs from companies with 100 employees or less

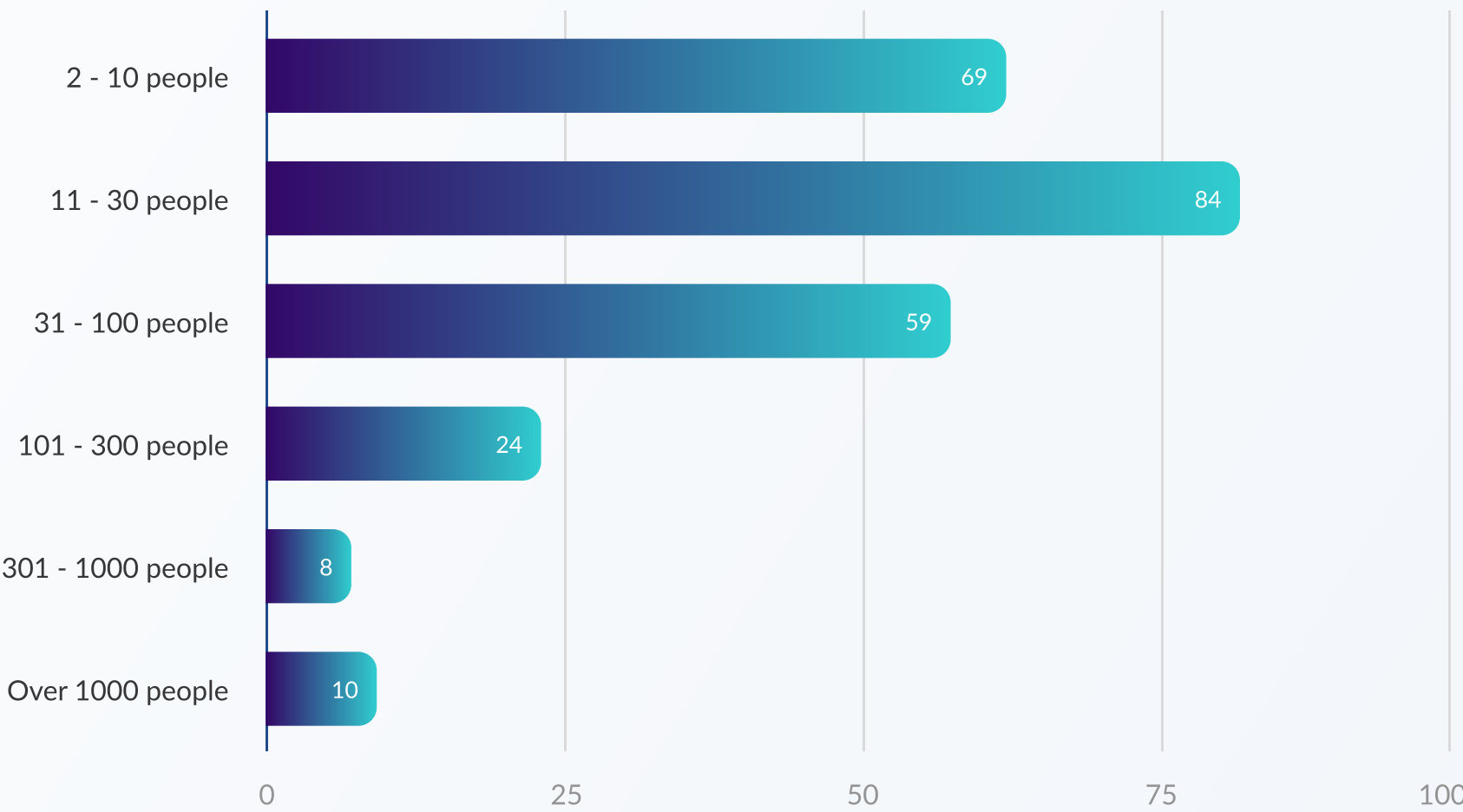
The “T” in CTO stands for Technology; that doesn’t always mean IT, but in our survey that was very often the case. 49% of our respondents came from the IT/Software industry, nearly matching all other industries combined.

In terms of company size, over 80% of our respondents work at organizations with a headcount of less than 100. This indicates that the results of our survey can be considered an accurate indicator of the situation of **startup and SME CTOs**. On the other hand, readers looking to extrapolate our findings about corporate CTOs should take our conclusions with a grain of salt due to the relatively small sample size.

Respondents by industry



Respondents by company size



Expert commentary

“The CTO is a manager first and foremost, but their work has always been a balancing act. On the one hand, nothing is more important than managing people right: hiring the right talent, supporting juniors so they can grow, and learning to delegate work to seniors so they can make autonomous decisions. On the other, the current situation makes IT infrastructure a big priority; most of the work that used to happen in a physical space now depends on the infrastructure that the CTO is responsible for. This is likely part of the reason behind the rise of DevOps—if our clients' needs are any indication, the importance of DevOps will only continue to grow.

Even though the future is uncertain, CTOs still need to make tech decisions looking not just at the current landscape, but trying to predict which solutions will stand the test of time 3-5 years from now. It's not an easy task, and we're proud we can play our role in helping CTOs rise up to the challenge.



Maciej Dziergwa

CEO @ STX NEXT

09

Credits & acknowledgments

Who helped make
this survey a reality?



Huge thanks to our partners

The Global CTO Survey would not have been possible without the support of our partners, who provided expert commentary, publicity for the survey, and freebies for survey respondents.

The logo for Clutch, featuring the word "Clutch" in a bold, dark blue sans-serif font with a small red dot above the 'i'.The logo for Modern CTO, featuring the words "Modern CTO" in a bold, black sans-serif font, with a small gold microphone icon to the right.The logo for Springboard, featuring a green and yellow stylized sunburst icon to the left of the word "Springboard" in a bold, dark blue sans-serif font.The logo for Hubstaff, featuring a blue gear-like icon with a white center, followed by the word "Hubstaff" in a bold, dark blue sans-serif font.The logo for BlueLife AI, featuring a blue square icon with a white line graph, followed by the text "BLUELIFE AI" in blue, uppercase letters, and "LEVERAGE THE POWER OF AI" in smaller, dark blue, uppercase letters below.The logo for SuperDataScience, featuring a blue icon of a network of nodes and lines, followed by the text "SuperDataScience" in a bold, blue sans-serif font.The logo for Defenselayers, featuring a blue and orange stylized icon of a building or structure, followed by the text "defenselayers" in a blue, lowercase sans-serif font.

About STX Next

We are Europe's largest Python software house, with over 15 years of experience helping CTOs and technical managers deliver software faster and meet their users' expectations. Our current roster includes over 200 developers specializing in **Python**, **JavaScript**, and **React Native**. They are supported by a network of Scrum Masters, Product Owners, data engineers, testers, designers and ML experts.

Since 2005, we've helped over 130 companies fill in their capacity gaps and get software projects done that wouldn't have been possible otherwise. When we're not delivering world-class software for our clients, we pour our energy into teaching the world what we know about programming, design, managing complex digital projects, and succeeding as a technology leader. The Global CTO Survey is part of that effort.



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