

# STATE OF SOFTWARE DEVELOPMENT

REPORT

20  
20

PUBLISHED BY

**CODING  
SANS**

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# INTRODUCTION

Welcome to the State of Software Development 2020 report!

We're proud to have been doing this report since 2017. We've come a long way since then.

This year, we've set a new record with 700+ tech people sharing their insights, as we've worked with 10 awesome partners to promote the survey.

The level of openness and enthusiasm we experienced in our shared effort is what's necessary to build things bigger than ourselves.

To build things that matter.

Software development matters to us.

We care about it, which is why we put in a tremendous amount of work to learn about its emerging trends.

We consider people in software development a world-wide community.

And we care deeply about the community, which is why we share all we've learned.

What's in the 2020 report?

We refined the questions, but they largely remained the same. The idea is to show trends and to present the changing landscape of software development in an easily readable way.

The report is divided into 5 main sections.

The first one focuses on management-related trends and challenges, followed by a technology and tool-focused chapter, hiring, outsourcing and performance management.

The data is filtered in different ways to show you the difference between the average and top-performing teams and between the challenges of developers and managers.

In some cases, we compare this year's data to previous results, to show you how things have been changing over the last few years.

I hope you will enjoy scrolling through the report and get some interesting insights you can apply right away.

Thank you,

Matt Wohlmuth  
Managing Director, Coding Sans

# OUR TOP PARTNERS

Publishing this report wouldn't have been possible without the close collaboration of our partners. They had the highest impact on taking this report to the next level and truly deserve a highlighted spot in this report.



The legendary GitKraken Git Client is designed to increase productivity by making Git processes fast and intuitive. Glo Boards help your dev team track tasks and sync in real-time with GitHub Issues. [Sign up for a free GitKraken account](#) to use both tools! Get \$10 discount on GitKraken Pro with this code: S0SD20.

Cooperpress is the publisher for several weekly email newsletters reaching an audience of over 350,000 developers and software engineers. Never miss the important info about your favorite technology. [Click here to subscribe for free!](#)

The leading ratings and reviews platform for IT, marketing, and business service providers used by over half a million buyers and sellers of services. Clutch has been recognized by Inc. Magazine as one of the 500 fastest growing companies in the U.S. and has been listed as a top 50 startup by LinkedIn. [Check them out at Clutch.co!](#)



# PARTNERS

Our partner companies did their fair part in promoting the survey and together, they made a serious impact on pushing the participation rate to the highest level ever achieved.



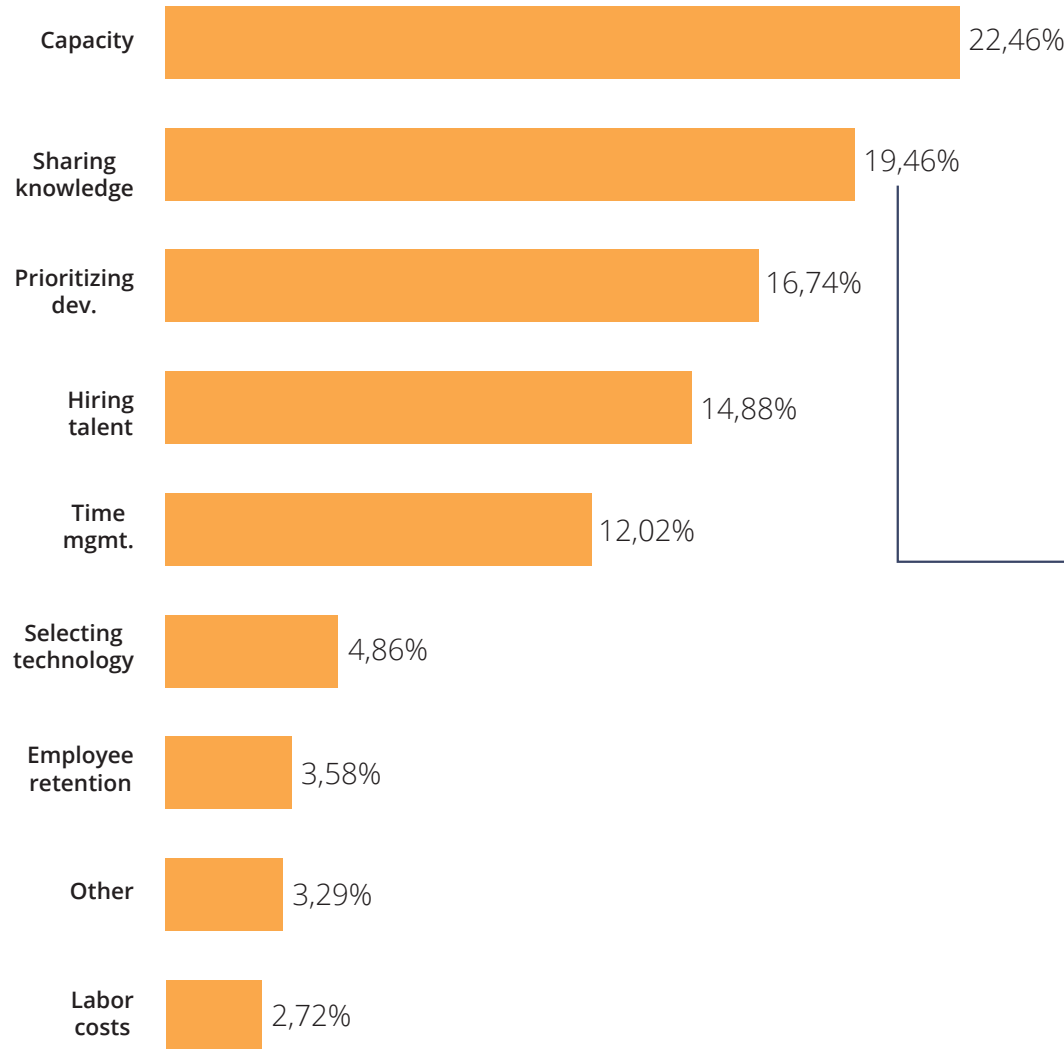
# MANAGING SOFTWARE DEVELOPMENT

The biggest challenge tech companies are facing is related to capacity: delivering working software while the backlog is full and capacity is limited.

After that, at a very close second, is knowledge sharing. Typically, knowledge sharing suffers first when the backlog is full and the deadline is approaching.

What makes this section more interesting is the separation of developers and developer managers since the nature of the two job categories are different, making their challenges different as well. Keep scrolling to see for yourself!

## What is your biggest challenge in software development?



## What have you done to overcome these challenges?

### CAPACITY

Capacity reigns supreme as the #1 challenge in software development. You've likely faced it too. It's commonly handled by hiring more developers to increase the potential work-load.

[Check out our post on how to recruit developers](#)

Alternatively, you can implement agile development methods and train your developers to use them, or increase engineering productivity by improving management.

[Some tips to improve engineering productivity](#)  
[How to build psychological safety](#)

### SHARING KNOWLEDGE

Knowledge sharing is currently the #2 challenge. Mentoring is an underutilized tool among software developers; it's worth looking into how to set up a system for it.

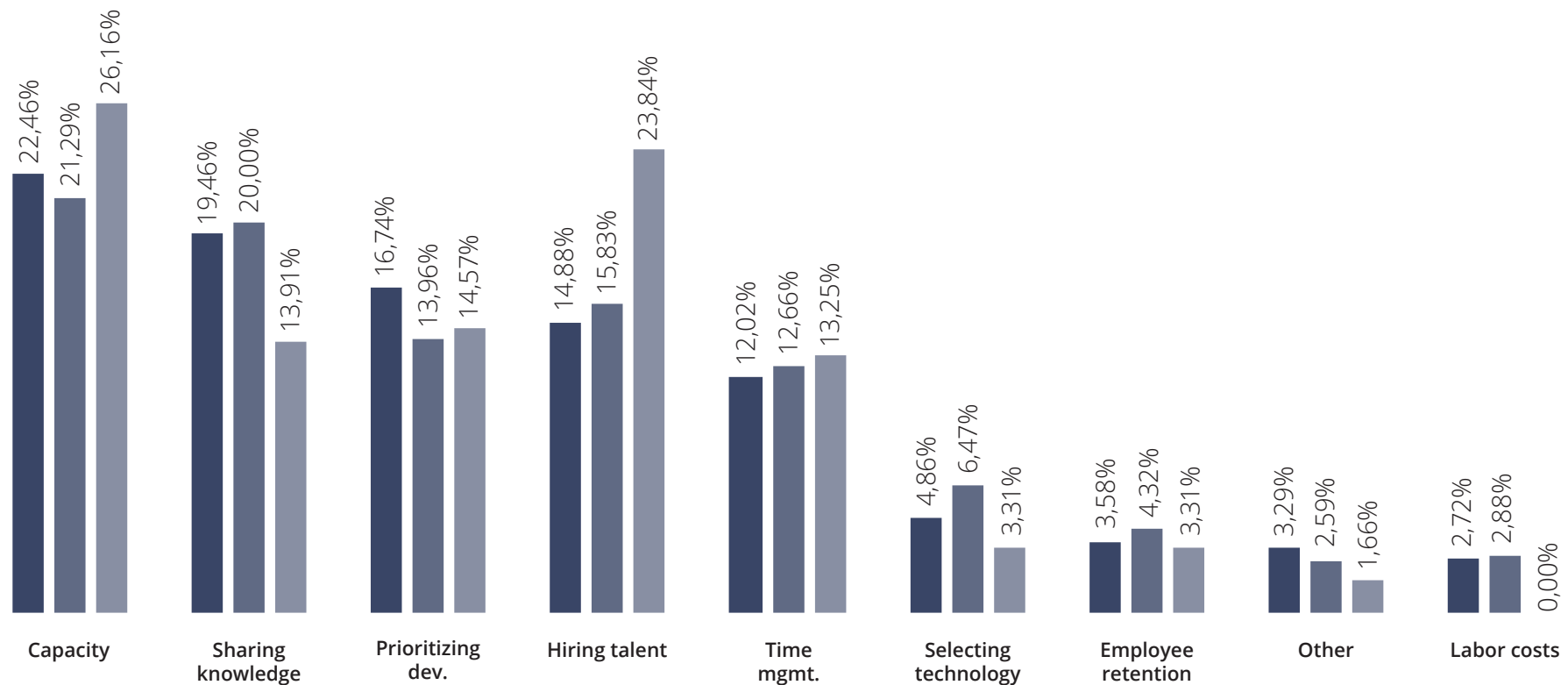
[How to mentor developers](#)

Beyond that, pair programming and code reviews are the most obvious. You can also use brown bag lunches to move it into a less formal environment or company hackathons to sharpen up your developers while letting them have fun.

[Check out these code review tips](#)  
[Read this agile training case study](#)

## What is your biggest challenge in software development?

■ 2020  
■ 2019  
■ 2018



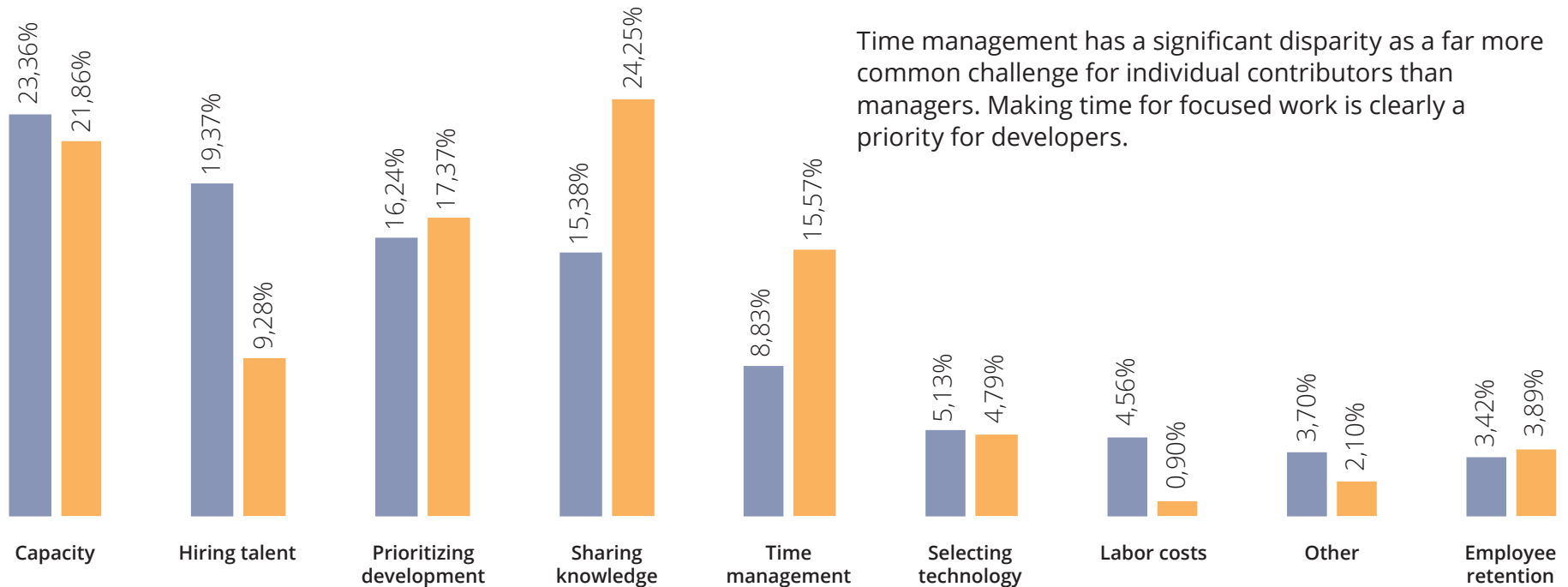
What has changed since last year? Are the challenges shifting?

This chart compares the 2018, 2019 and 2020 data, displaying how the challenge focus is shifting.

Hiring was the biggest challenge in 2018. It still accounts for the fair part of challenges. But since last year, survey participants said their biggest challenge is handling capacity.

## What is your biggest challenge in software development?

■ Manager  
■ Developer



The #1 challenge for managers is dealing with capacity issues. Managers plan features and deal with business needs as well. This one is key for developers as well, but it only ranked second for them.

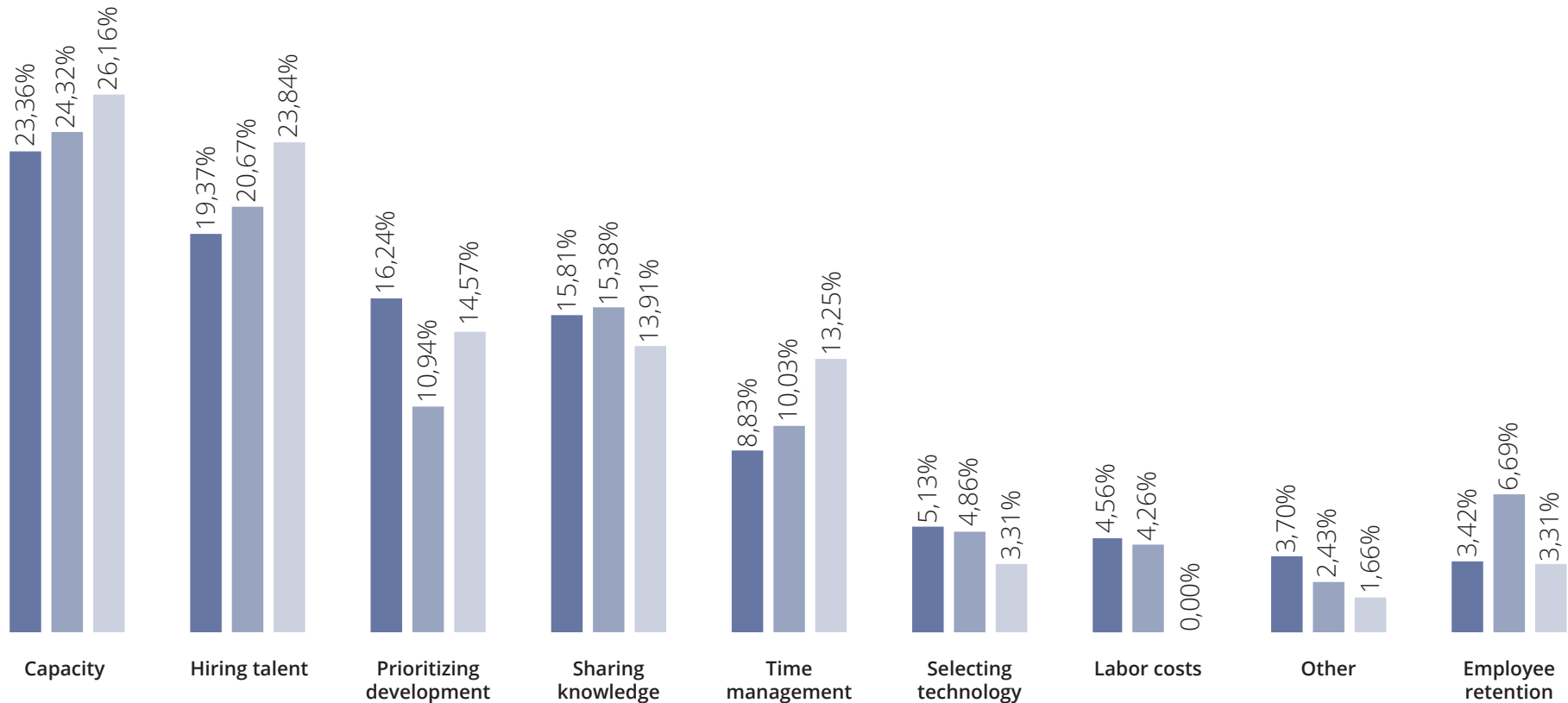
The #1 challenge for developers is sharing knowledge. It's key to optimize your work routine, whether you on-board for a project, or mentor junior developers. It's #4 for managers.

Hiring talent is #2 for managers, as the lack of workforce is still an industry-wide issue. Naturally developers are far less worried about hiring.

Time management has a significant disparity as a far more common challenge for individual contributors than managers. Making time for focused work is clearly a priority for developers.

## What is your biggest challenge in software development? (managers)

■ 2020  
■ 2019  
■ 2018



What has changed since last year? Are the challenges shifting?

This chart compares the biggest challenges of engineering managers and how they have shifted from 2018-2020.

Hiring was the biggest challenge in 2018. It's still #2, but over the last two years, the biggest challenge became handling capacity.

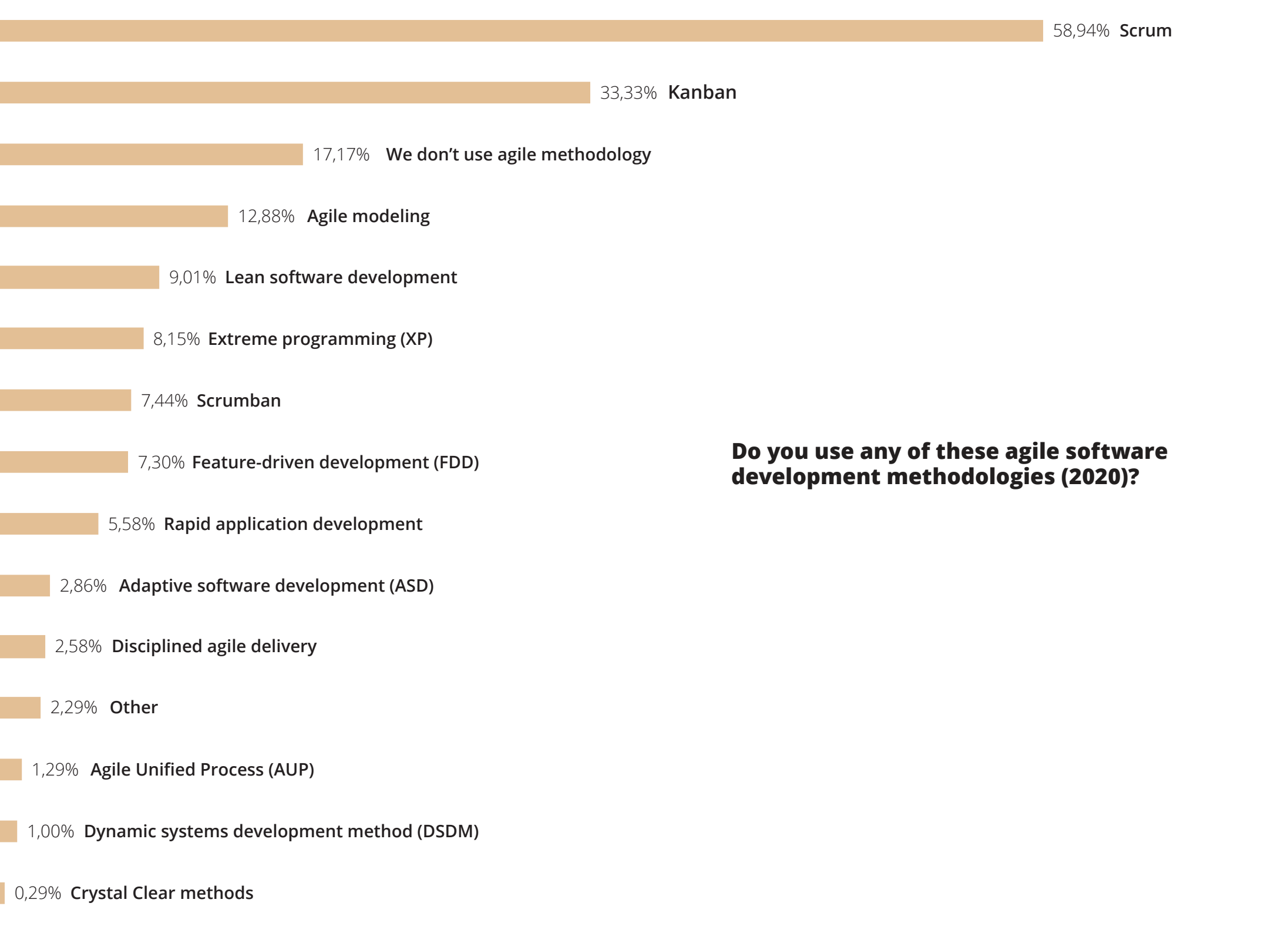
## What is your biggest challenge in software development? (developers)

2020  
2019  
2018



But what about the developers? We did the same magic to see if the challenge trends are changing compared to last year.

In 2018, capacity and time management were the top challenges developers were facing. By 2019 and 2020, developer participants said their biggest challenge is sharing knowledge between the team members and dealing with capacity.



58,94% Scrum

33,33% Kanban

17,17% We don't use agile methodology

12,88% Agile modeling

9,01% Lean software development

8,15% Extreme programming (XP)

7,44% Scrumban

7,30% Feature-driven development (FDD)

5,58% Rapid application development

2,86% Adaptive software development (ASD)

2,58% Disciplined agile delivery

2,29% Other

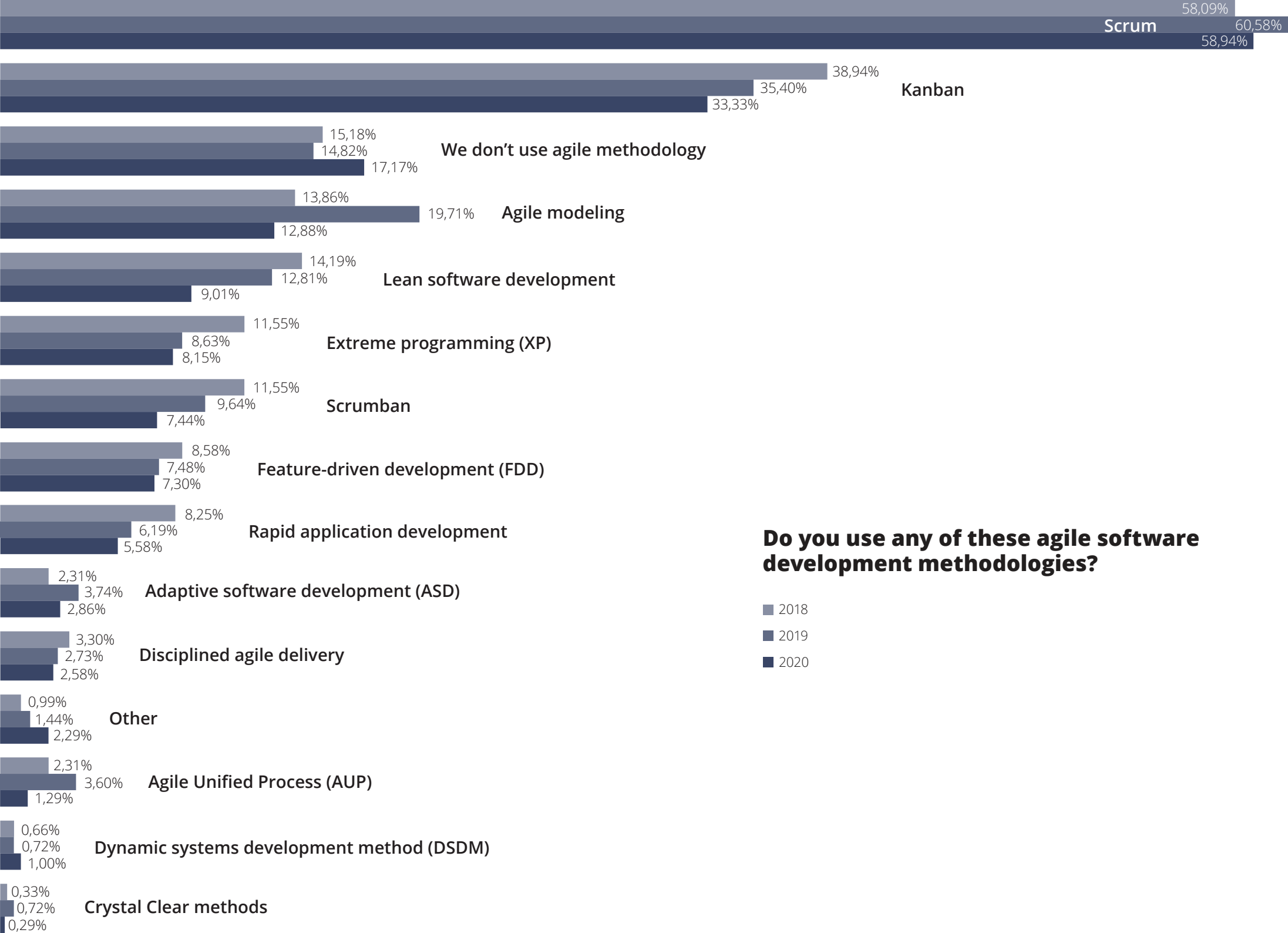
1,29% Agile Unified Process (AUP)

1,00% Dynamic systems development method (DSDM)

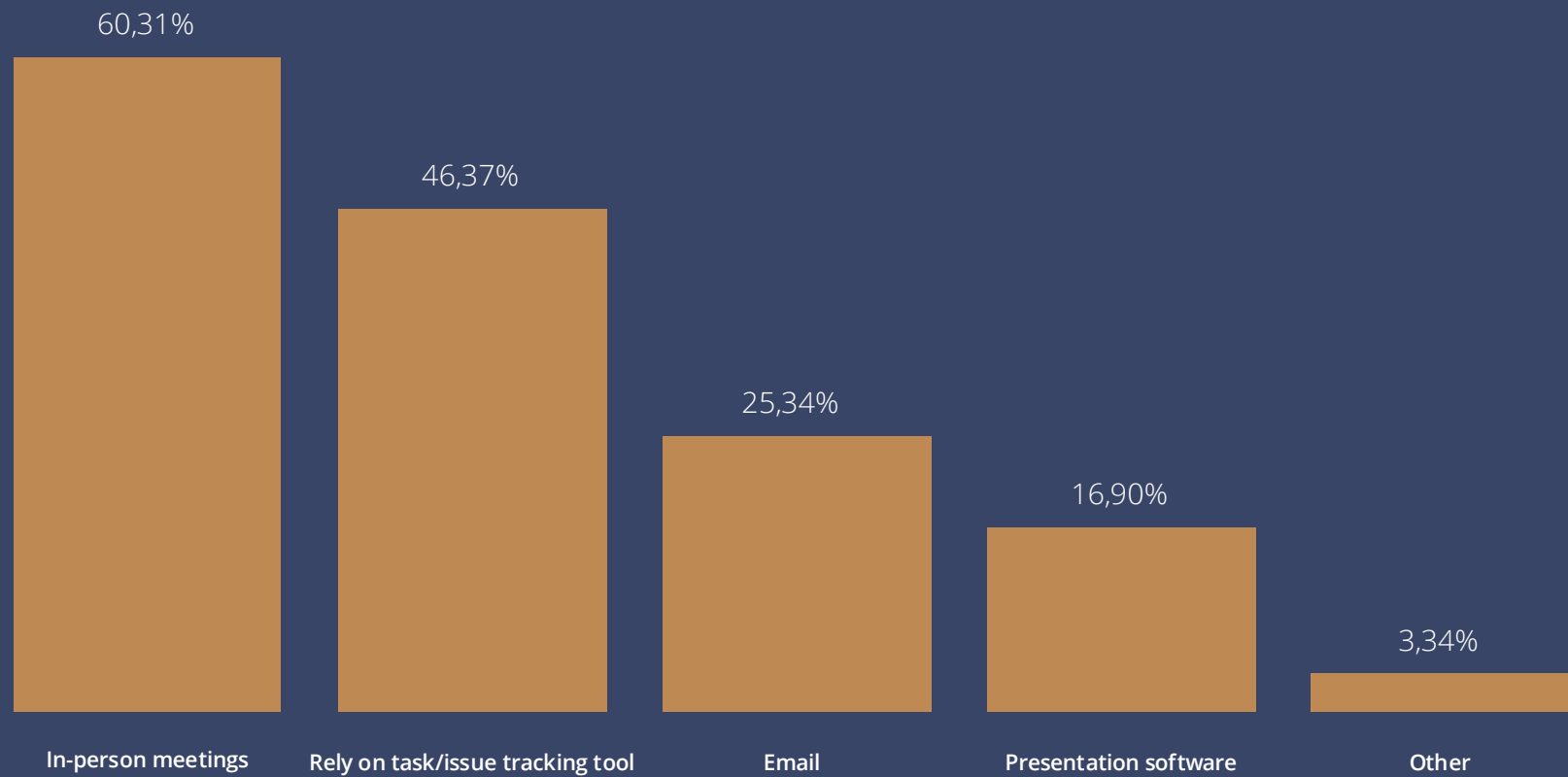
0,29% Crystal Clear methods

**Do you use any of these agile software development methodologies (2020)?**





## How do you communicate project milestones/releases/deadlines?



Is remote work allowed at your  
company? (2020)

**23.46%**

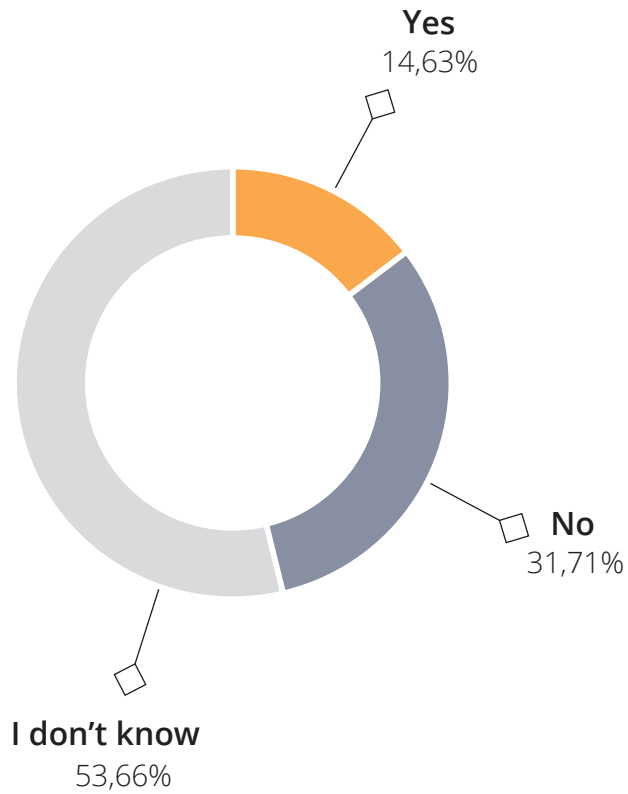
NO

**76.54%**

YES

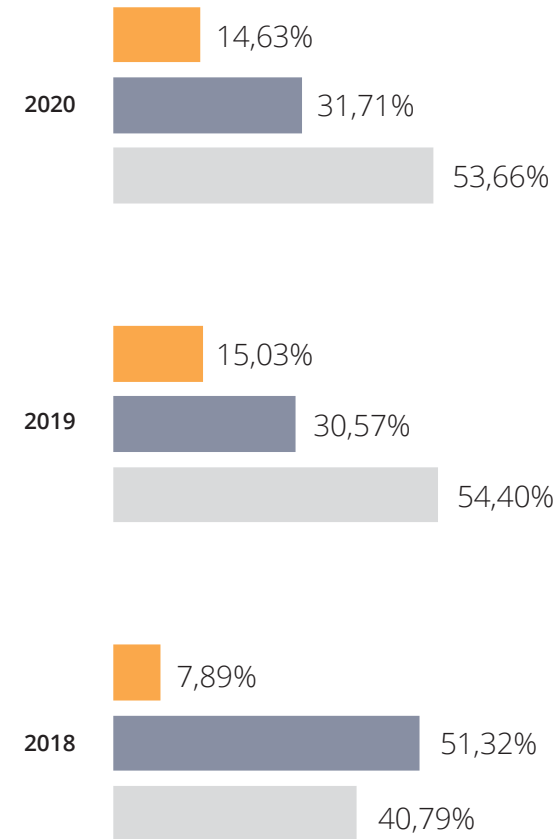
## Are you planning to allow remote work in the next 12 months? (2020)

Yes  
No  
I don't know



## Are you planning to allow remote work in the next 12 months? (2018-2020)

Yes  
No  
I don't know



# Interview with Katie Womersley

VP of Engineering, Buffer



**“People often ask me, how do you know the engineers are working hard? But the problem I really have is, how do I know they ever stop working?”**

## Remote work at Buffer:

“It’s important to trust your team-mates that they are doing their best work possible, everybody has good intent, and everyone’s trying to be productive.

Trust is important for a developer team. It goes both ways: if you’re trusting your team, you’re also free to ask for help when you’re stuck or blocked, and you trust that they’re not going to judge you.

## Clear communication

Clear communication skills are very important; otherwise, it’s very difficult for a team to stay in sync and to share context.

## Work-life balance

We encourage our developer team to work really hard on their work-life balance, and not to overwork.

People often ask me, how do you know the engineers are working hard? But the problem I really have is, how do I know they ever stop working?

People tend to overcompensate whenever they’re remote, since they know there’s a lot of freedom, they want the job, and they appreciate the privilege of being remote almost too much. Sometimes they try too hard to prove that they are not slacking off.

Managers need to be sure to keep the culture healthy and not encourage over-work and burnout.”

Check out the full interview on the:

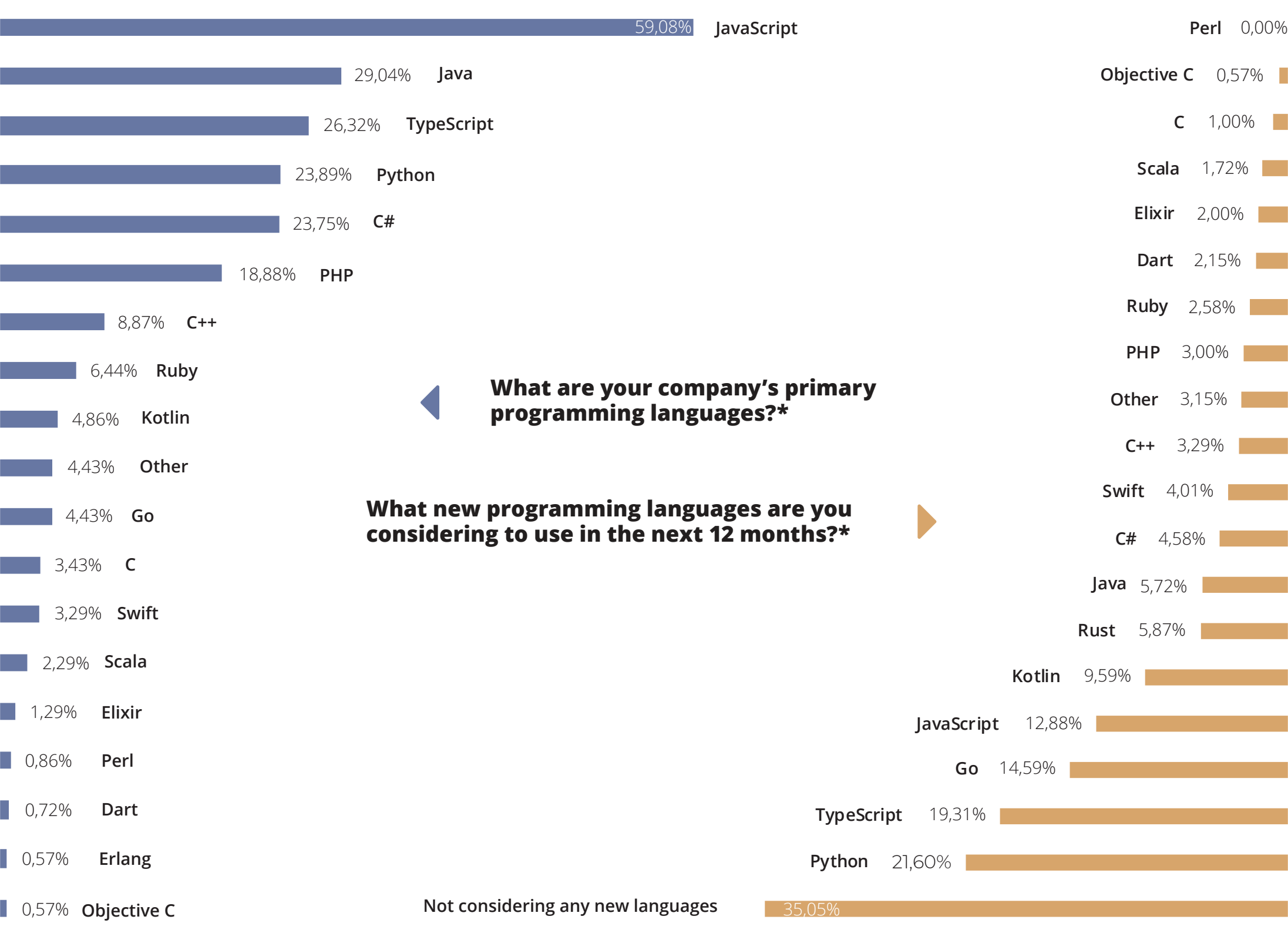
**LEVEL-UP**  
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# TOOLS & TECH

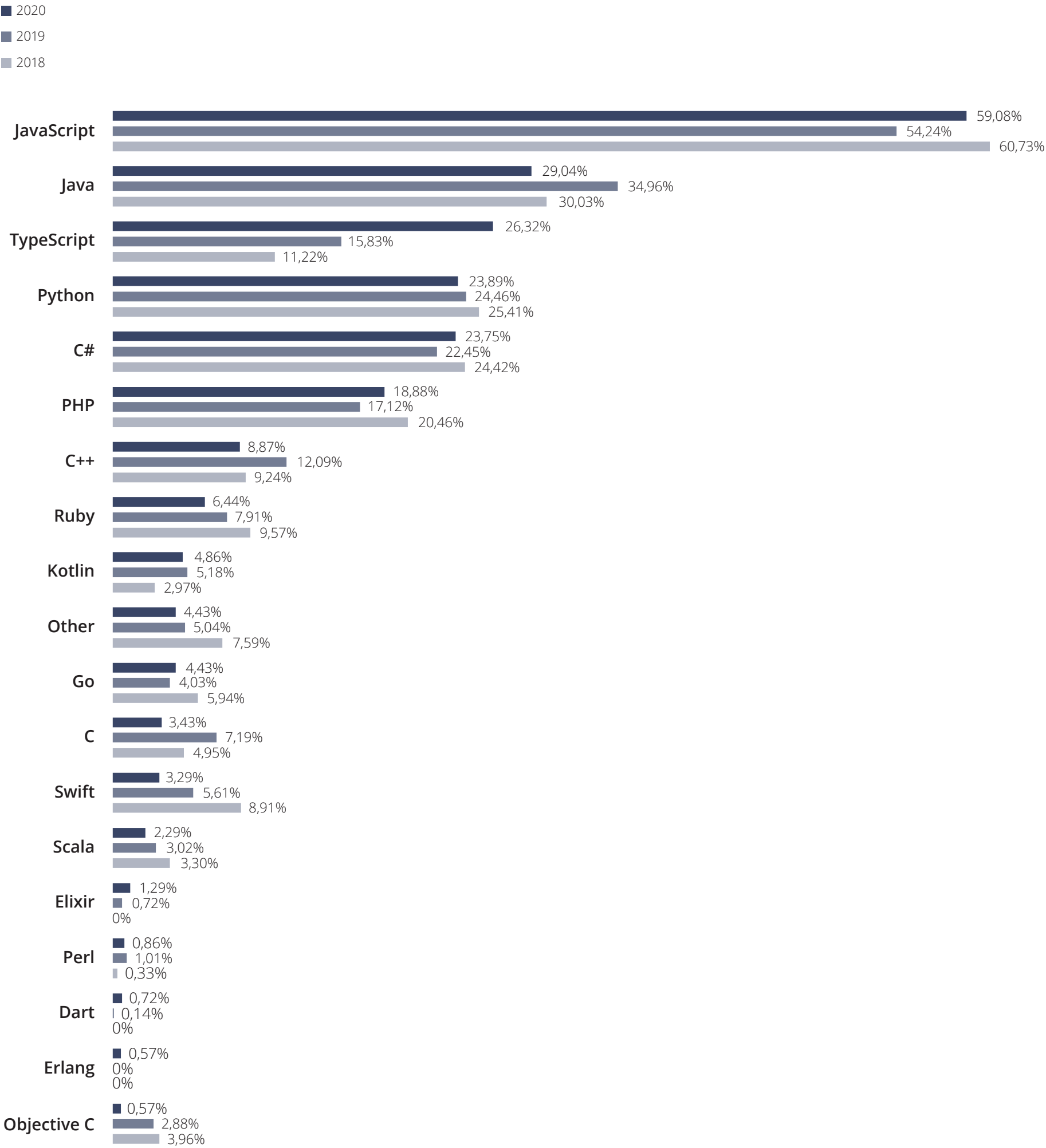
This section shows the most popular programming languages and tools developer teams use for testing, project management, version control, and communication.

Developer teams use a wide variety of tools (especially for testing and project management), which makes it especially hard to present the tools on a chart. The chart shows a few industry-leading tools, following an army of tools forming a long tail at the right end of the chart.

On the programming languages' side, it's exciting to see how newer technologies are gaining momentum and climbing in popularity.

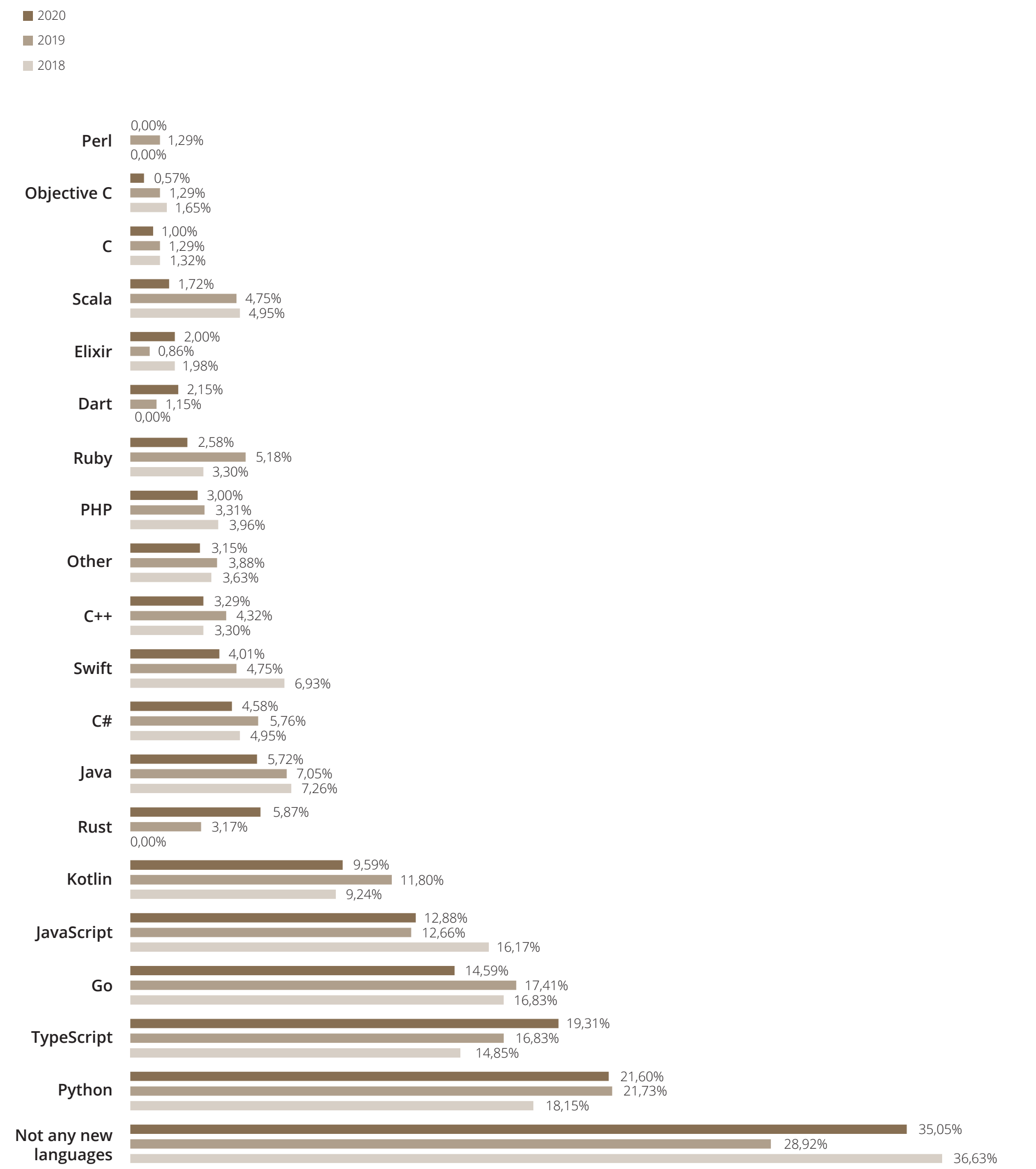


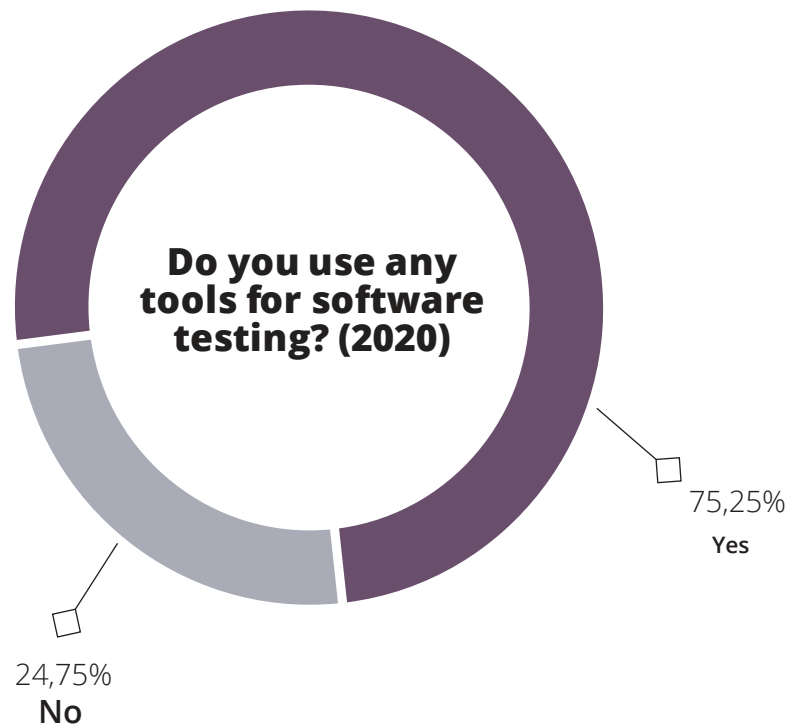
# What are your company's primary programming languages? (2018-2020)



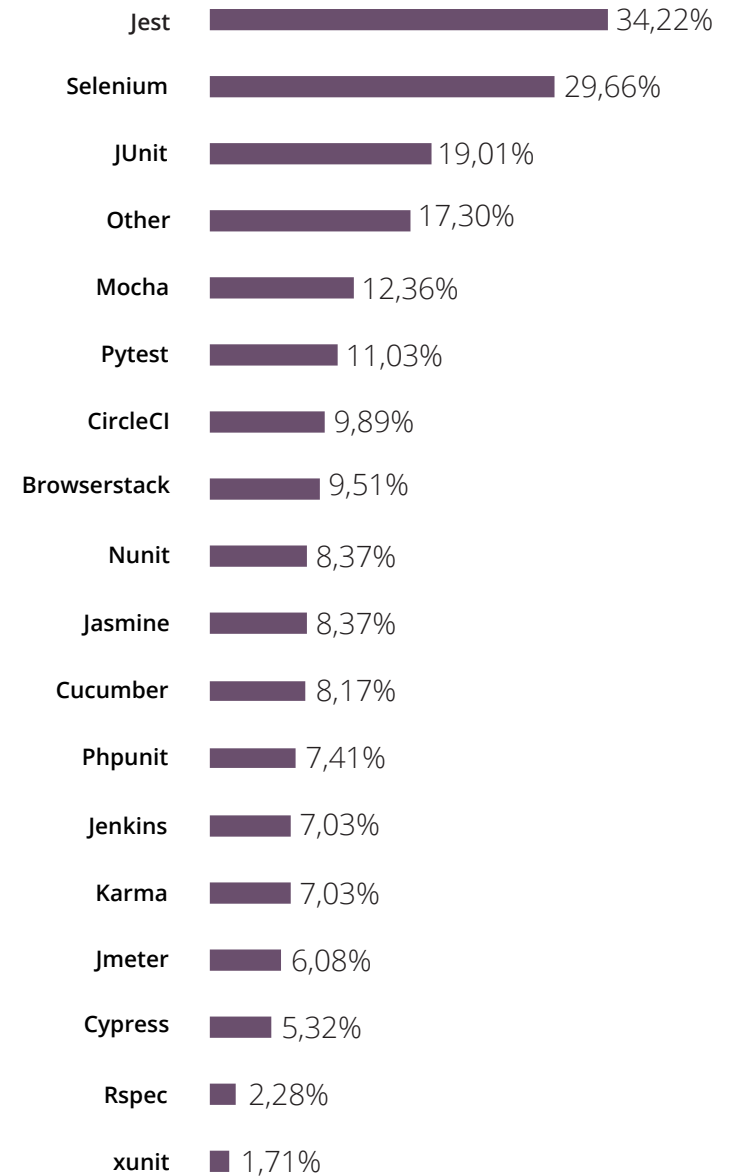


What new programming languages are you considering to use in the next 12 months? (2018-2020)

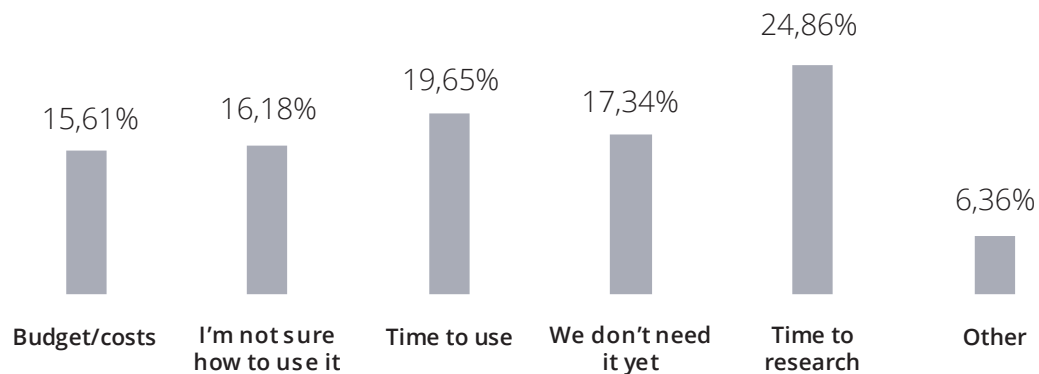




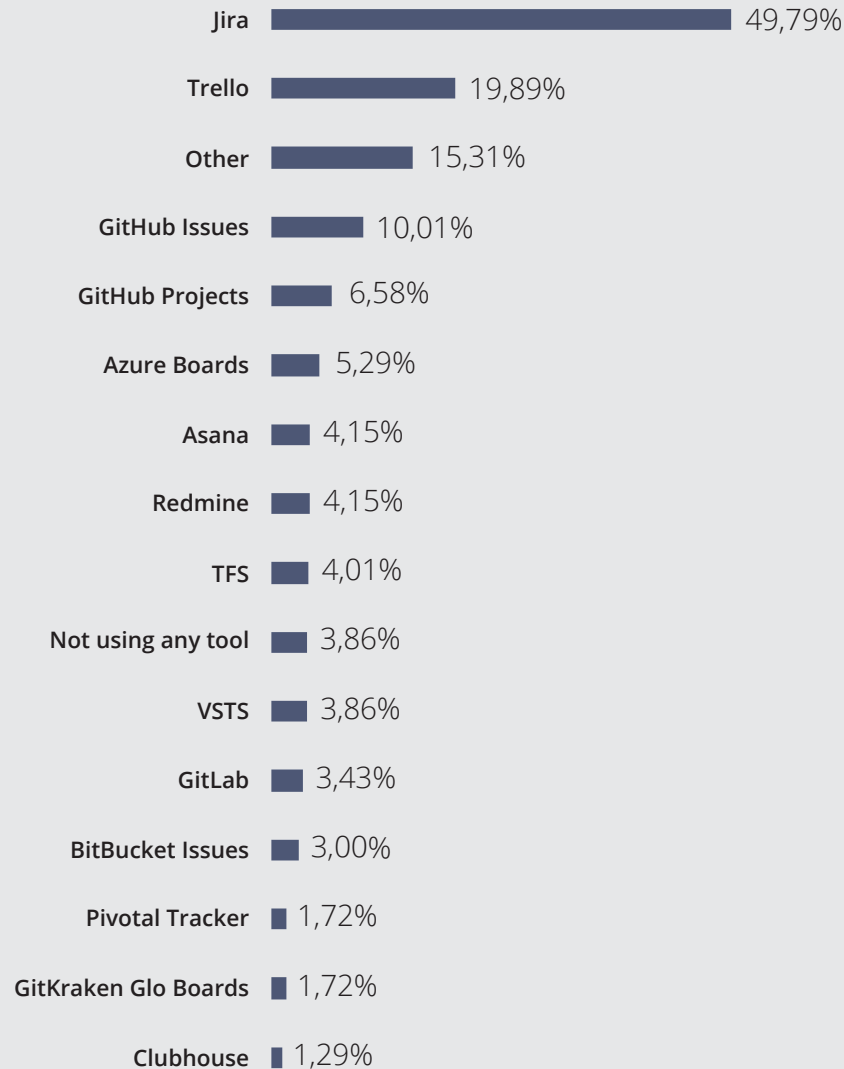
### What tool(s) do you use for testing?



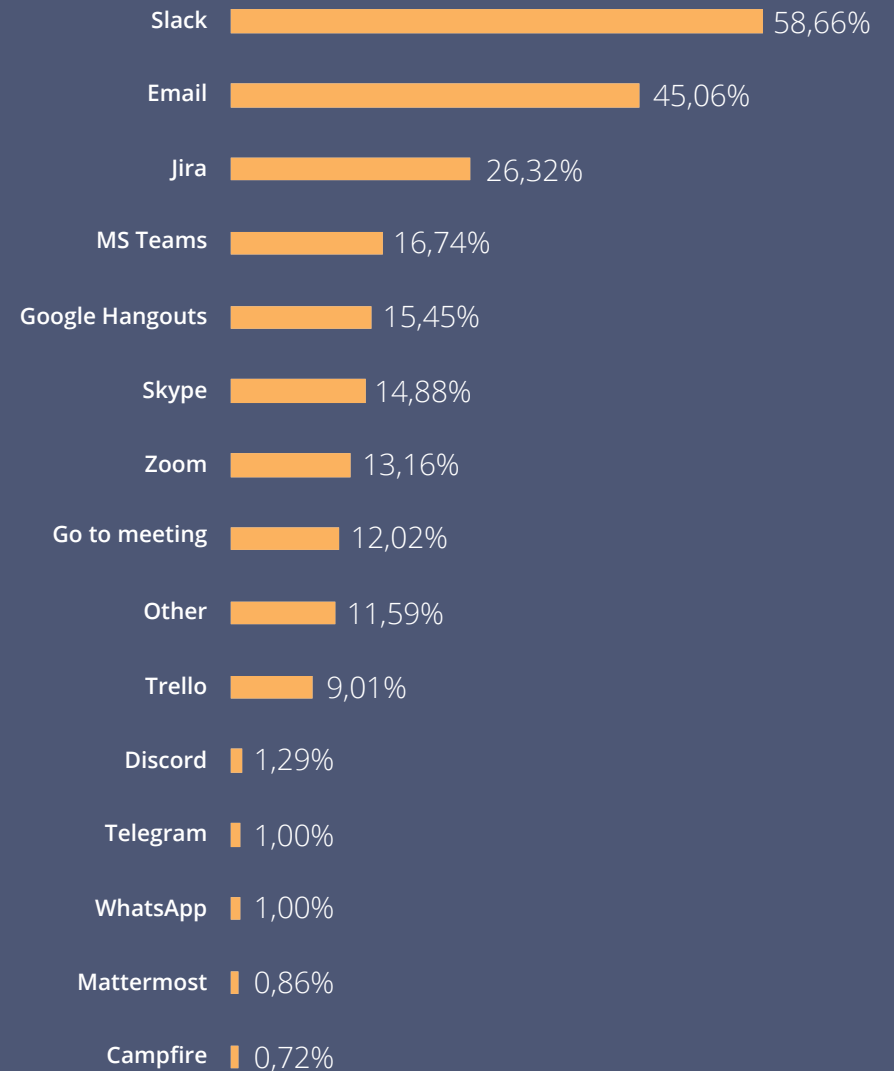
### What are the factors that are limiting you from using a software testing tool?



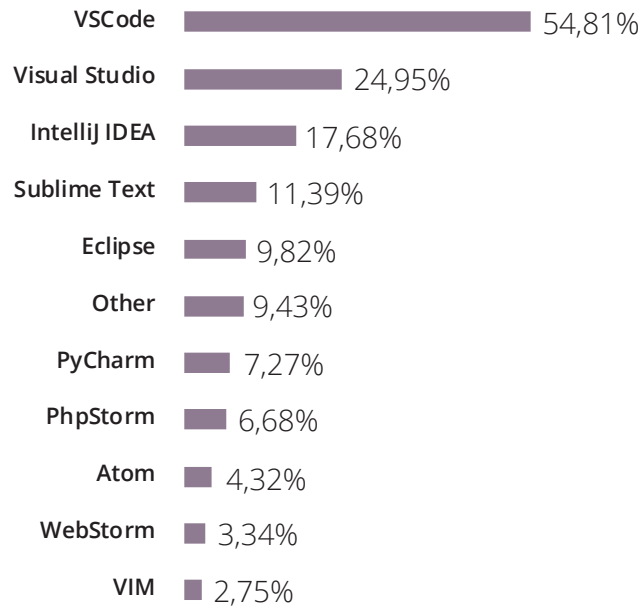
## What tool do you use for project management?



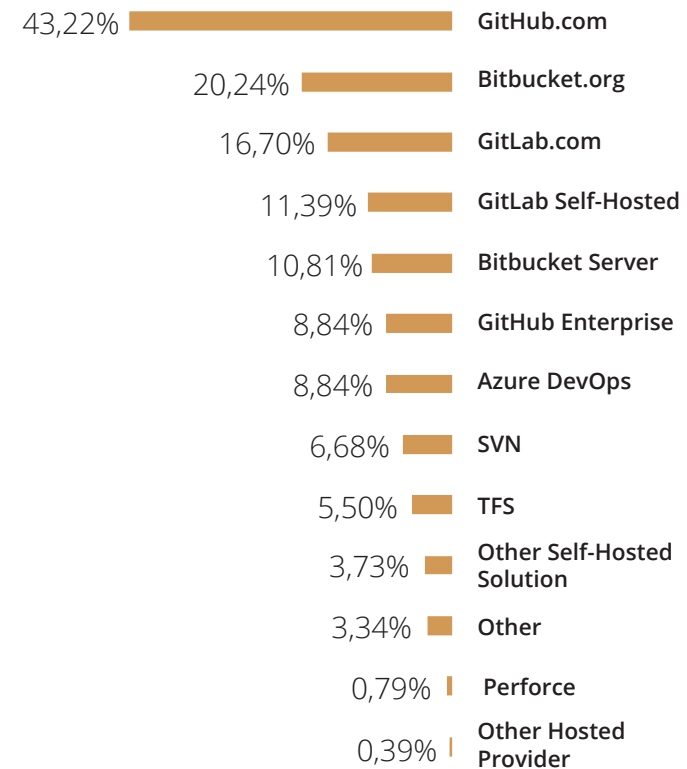
## What tools do you use to communicate during a project?



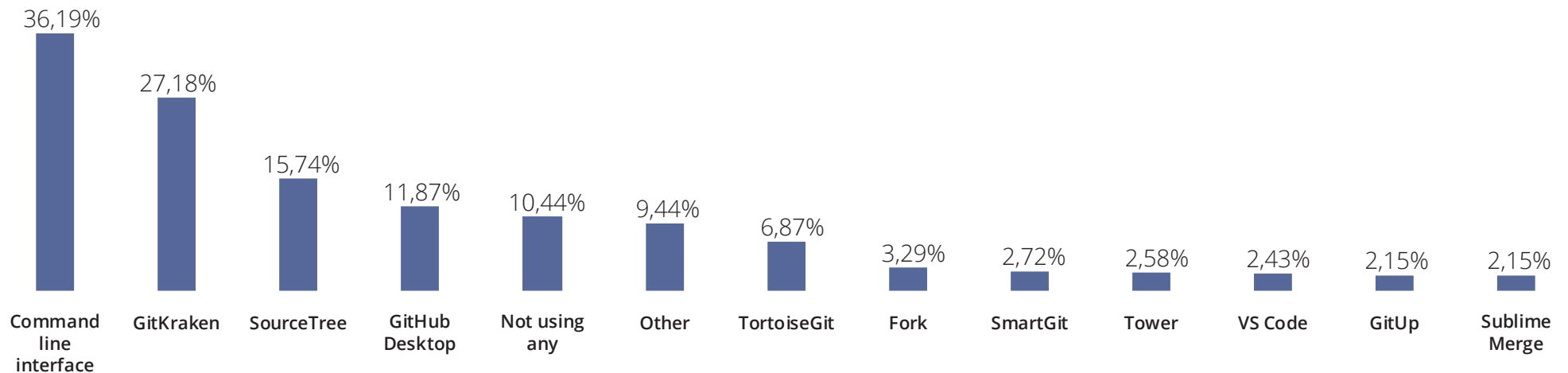
## What IDE(s) do you use?



## What version control system do you use?



## What source control client(s) do you use?



# HIRING TALENTS

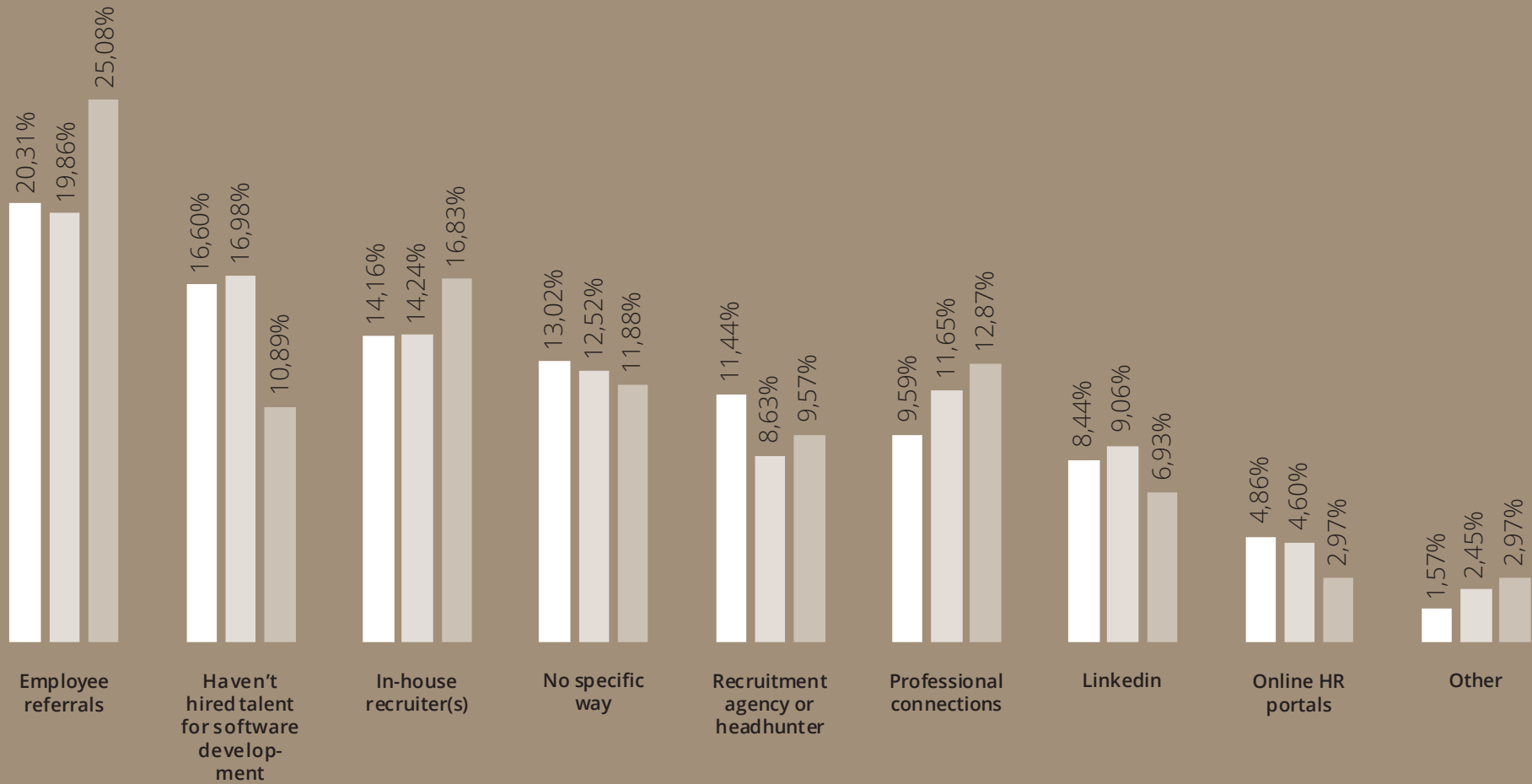
Hiring and retaining developers are critical parts of managing a developer team. We wanted to learn more about how tech companies hire and retain talents.

Since 2018, the most effective hiring methods haven't changed. Employee referrals and having in-house recruiters are the best ways to hire talent.

This chapter also covers statistics on hiring criteria and employee retention, segmented by top- and average-performing teams to see if there is anything top-performing teams do differently compared to the average ones.

## What's your most efficient method to hire talent? (2018-2020)

■ 2020  
■ 2019  
■ 2018



# Interview with Greg Sabo

Engineering Manager, Asana



**"We create lots of mentorship capacity, but we make sure that we're not piling on five interns per experienced engineer on any team."**

## Hiring at Asana:

"We recruit many engineers from universities, so we often visit campus events. We target ten different schools across the country to visit and develop a relationship with.

This channel is important to us, and not just for volume, but also for shaping diversity in our pipeline. We found that it helps to develop relationships with organizations for members of underrepresented groups.

We create lots of mentorship capacity, but we make sure that we're not piling on five interns per experienced engineer on any team.

We build a strong community of interns, especially during times when there's several of them at once. We hold specific intern events for people

to bond and learn more about the company, or just do fun things together.

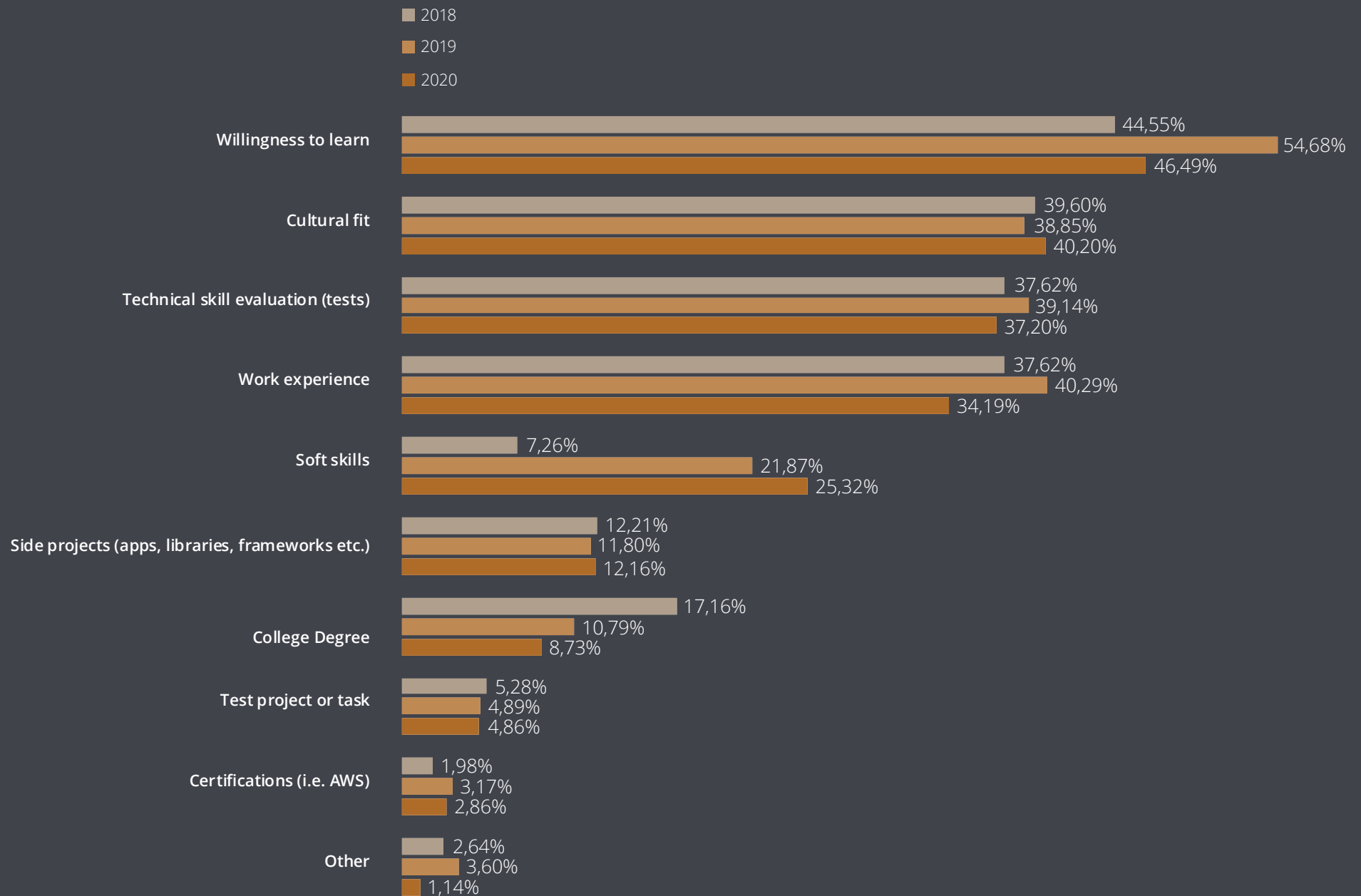
We extend offers to a majority of our interns, but not all of them. We know this is on their minds, so we clearly communicate with them about their progress, whether they're meeting the expectations of Asana.

All the interns we have are skilled engineers, it comes down to the type of work we need to do. Asana is a particular company with a particular culture, and we need to navigate a tightly integrated codebase across multiple teams. It requires a set of skills not all engineers are interested in developing."

Check out the full interview on the:

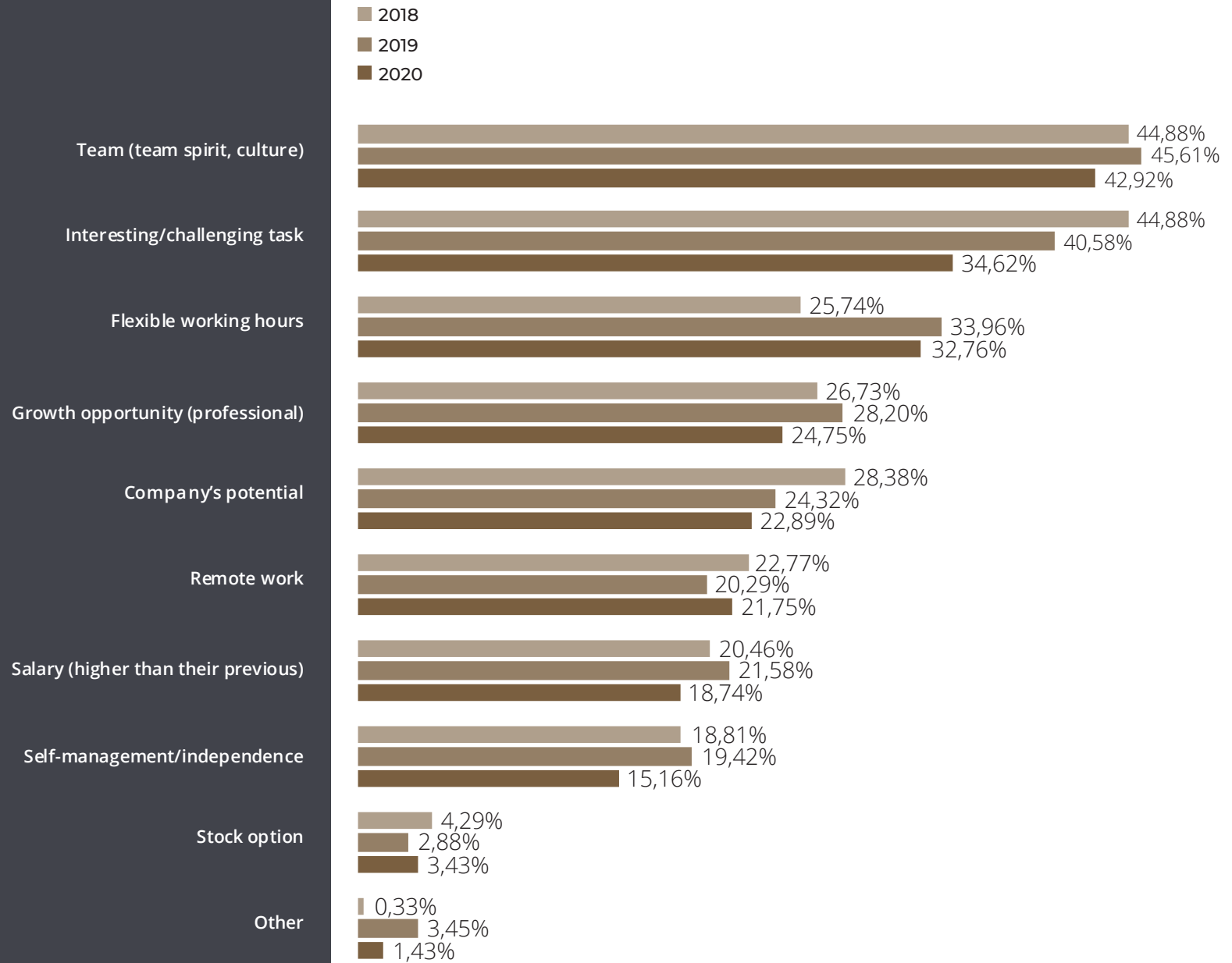
**LEVEL-UP**  
**ENGINEERING**  
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## What are your most important hiring criteria?





## How do you attract new software developers?



# Interview with Rich Archbold

VP of Engineering, Intercom



**“We are explicitly looking for culture contribution instead of cultural fit, because we’re always open to a more diverse way of thinking.”**

## Hiring at Intercom:

“The interview questions are past-performance-based. We're trying to learn about what you've done so far, not how you think you might react in an imaginary scenario.

Somebody can absolutely get hired if they do poorly on the data modeling interview but do well on the culture contribution interview. We won't make a hire if somebody does well on the tech design interview but poorly on the culture contribution interview.

We are explicitly looking for culture contribution instead of cultural fit, because we’re always open to a more diverse way of thinking.

The biggest mistake you can make is not putting enough emphasis on hiring for behavior and attitude. It's the most expensive one too. You want to be thorough, since it can be a costly mistake for all parties involved. An unsuccessful hire hurts everyone in the long run, because you'll likely end up parting ways at around six to 12 months. It's not fun.

Understand the balance of strengths in your organization, and you're not just thinking about adding people but strengthening the team.”

Check out the full interview on the:

**LEVEL-UP**  
**ENGINEERING**  
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## How do you keep software developers motivated?

2018  
2019  
2020

Team (team spirit, culture)

Challenging/engaging work

Autonomy

Variety of tasks

Exciting product

Money

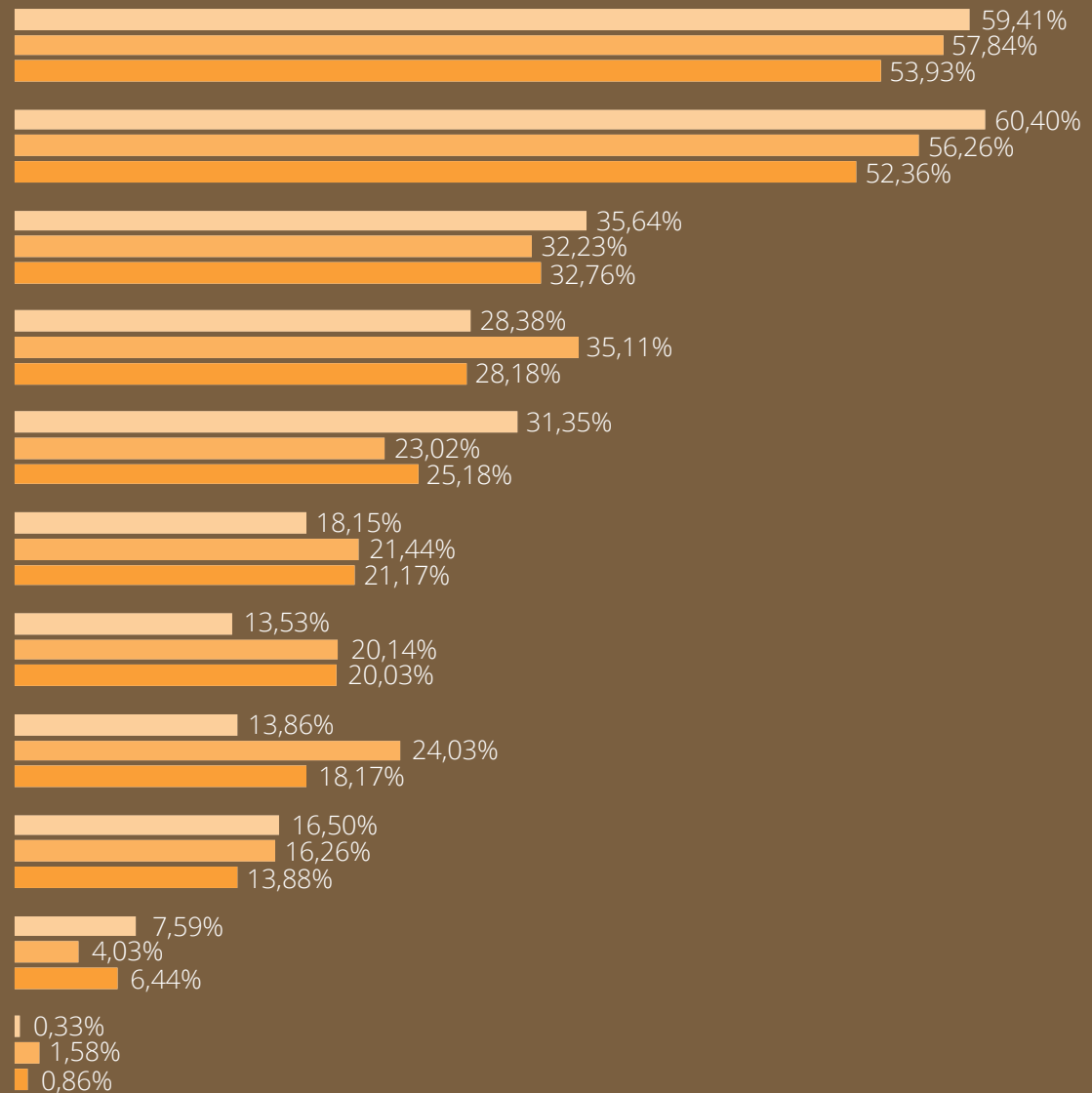
Career path

Trainings

Extra benefits

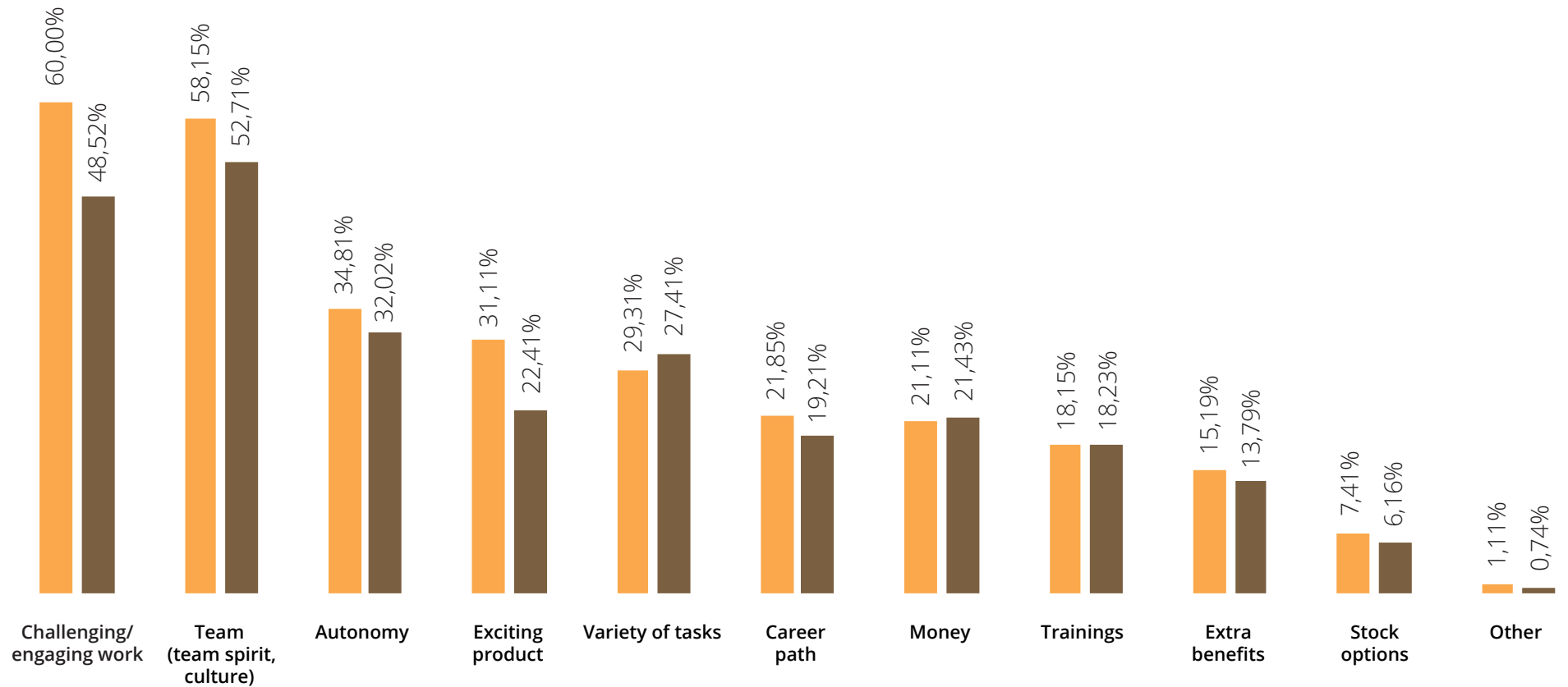
Stock options

Other



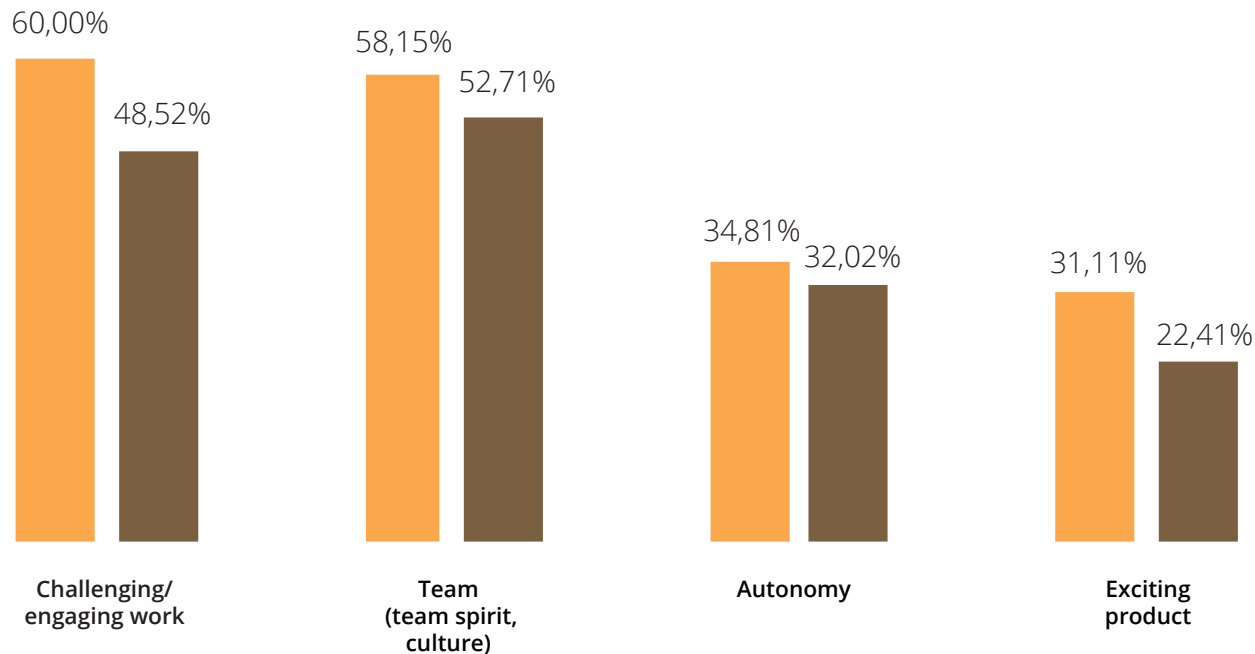
## How do you keep software developers motivated? (2020)

Top performers  
Average performers



## How do you keep software developers motivated? (2020 Top vs Average performers)

Top performers  
Average performers



We looked for differences between the ways top and average performers motivate developers. It's a key area for both employee retention and productivity.

We found that the biggest differences are in providing challenging work and building an exciting product. Top performers put significantly more emphasis on both.

Top and average performers both prioritize engineering culture and autonomy high, they're key factors as well.

[Learn more about the engineering culture at Monzo!](#)

# SOFTWARE DEVELOPMENT OUTSOURCING

Since dealing with capacity issues is one of the biggest challenges along with hiring talent, outsourcing seems like a quick fix. This chapter presents data on the proportion of companies that outsourced software development in the last 12 months and also the ones that are planning to do so in the next year. We also were interested in if they were satisfied with the outsourcing partner's performance.

Have you outsourced software development fully or partly in the last 12 month? (2020)

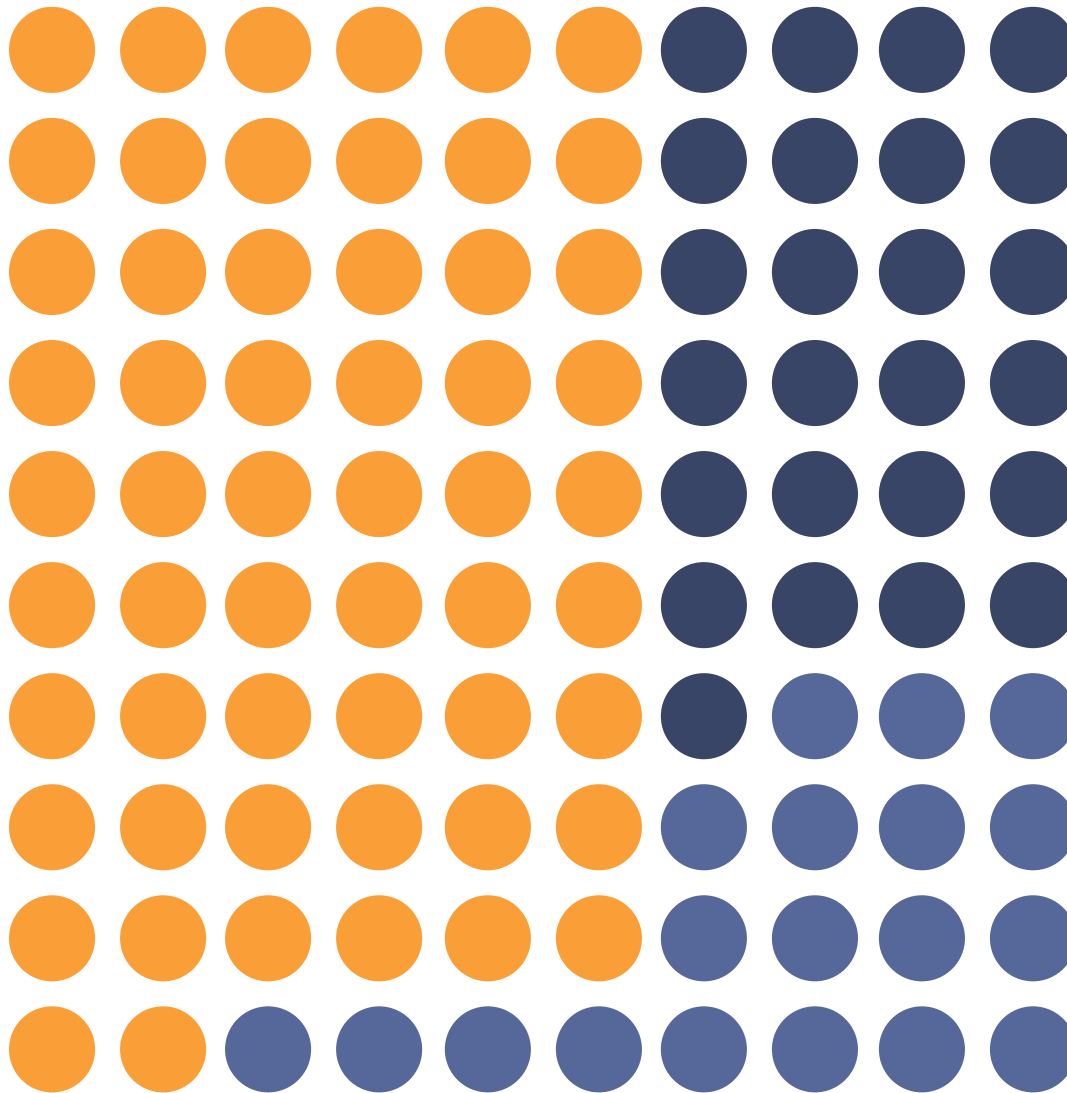
**37,48%**

YES

**62,52%**

NO

## To whom?



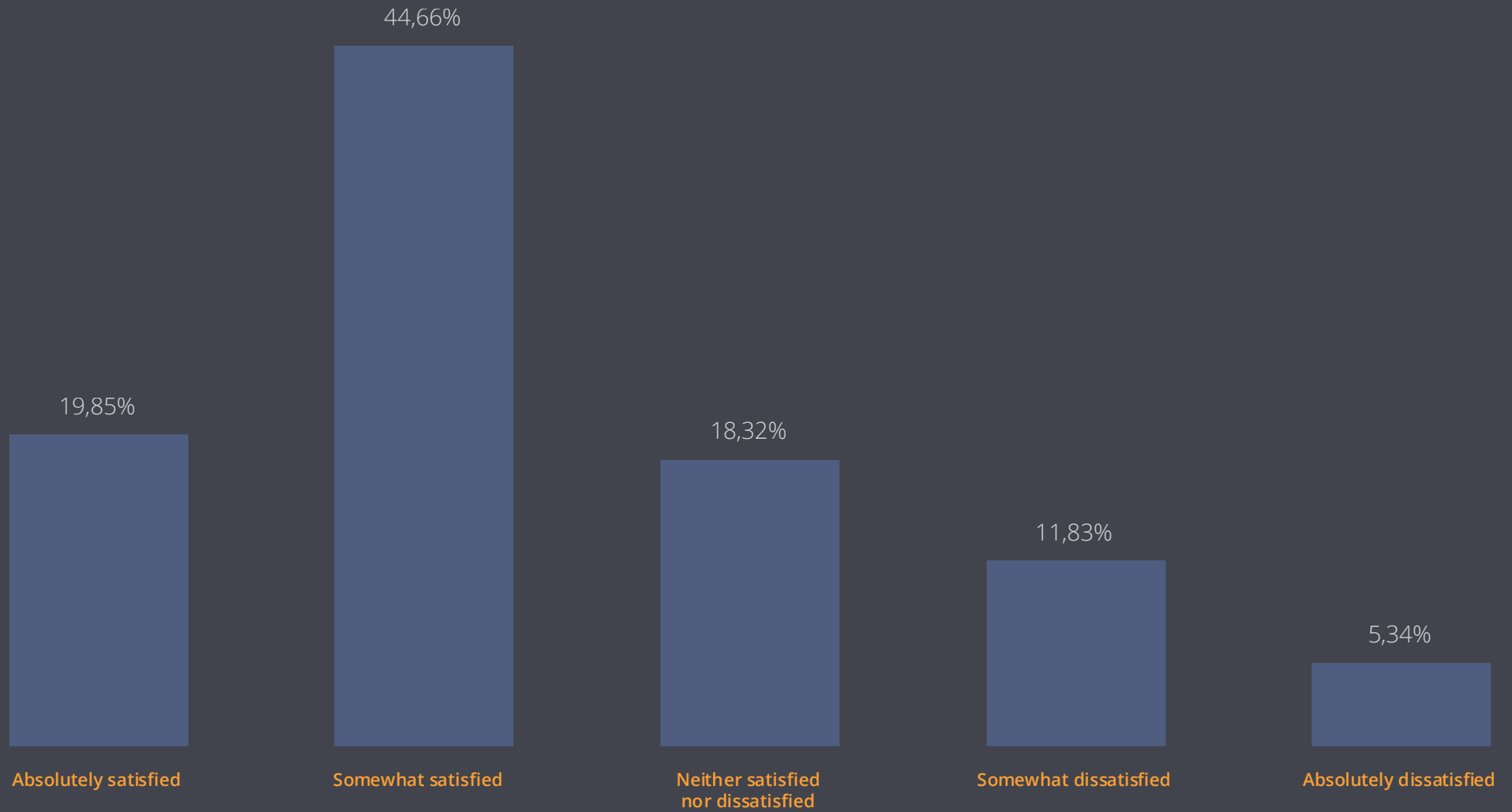
**56%** ● Software development company

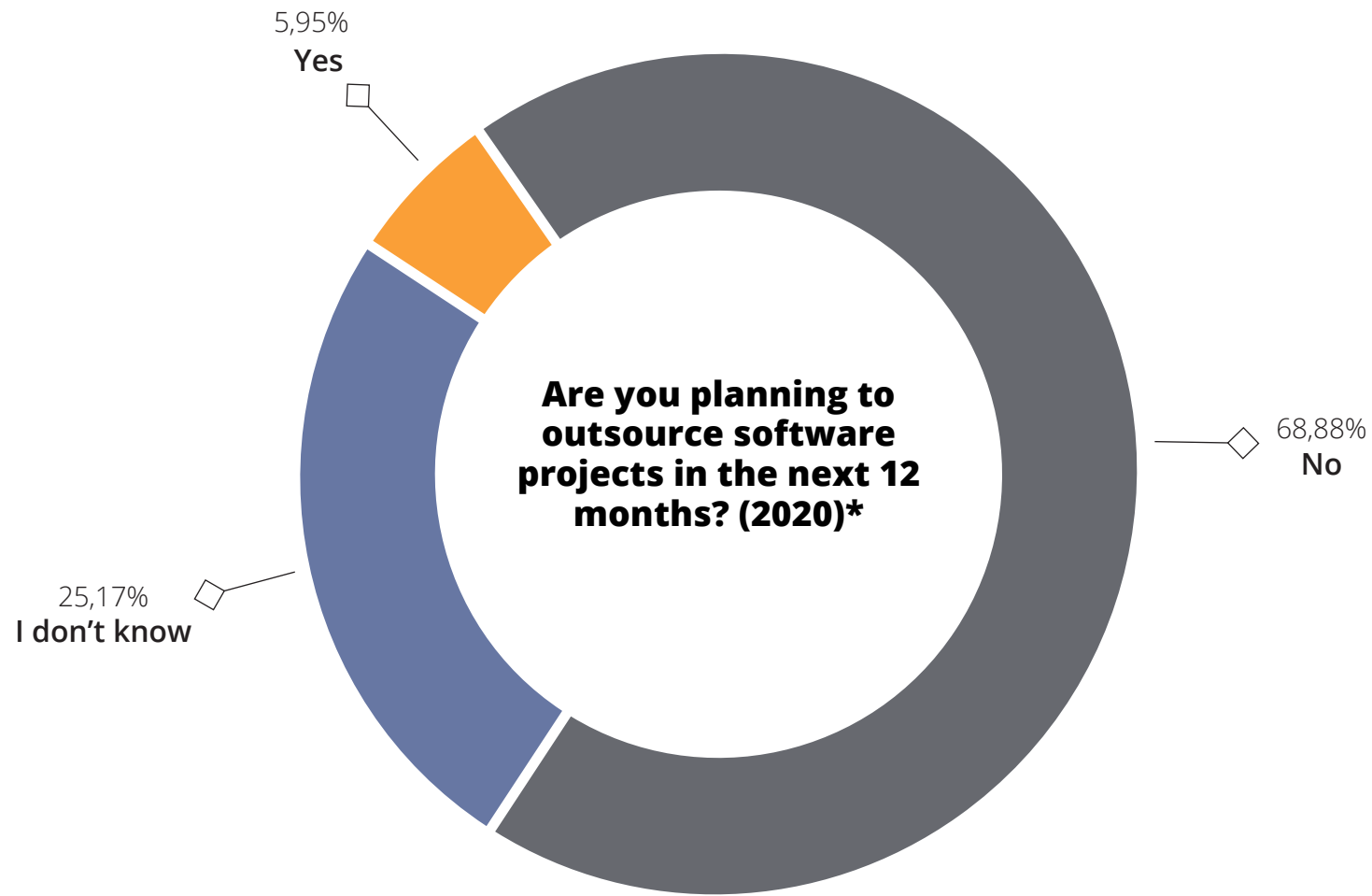
**25%** ● Freelancer

**19%** ● Both



## How satisfied were you with the results? (2020)



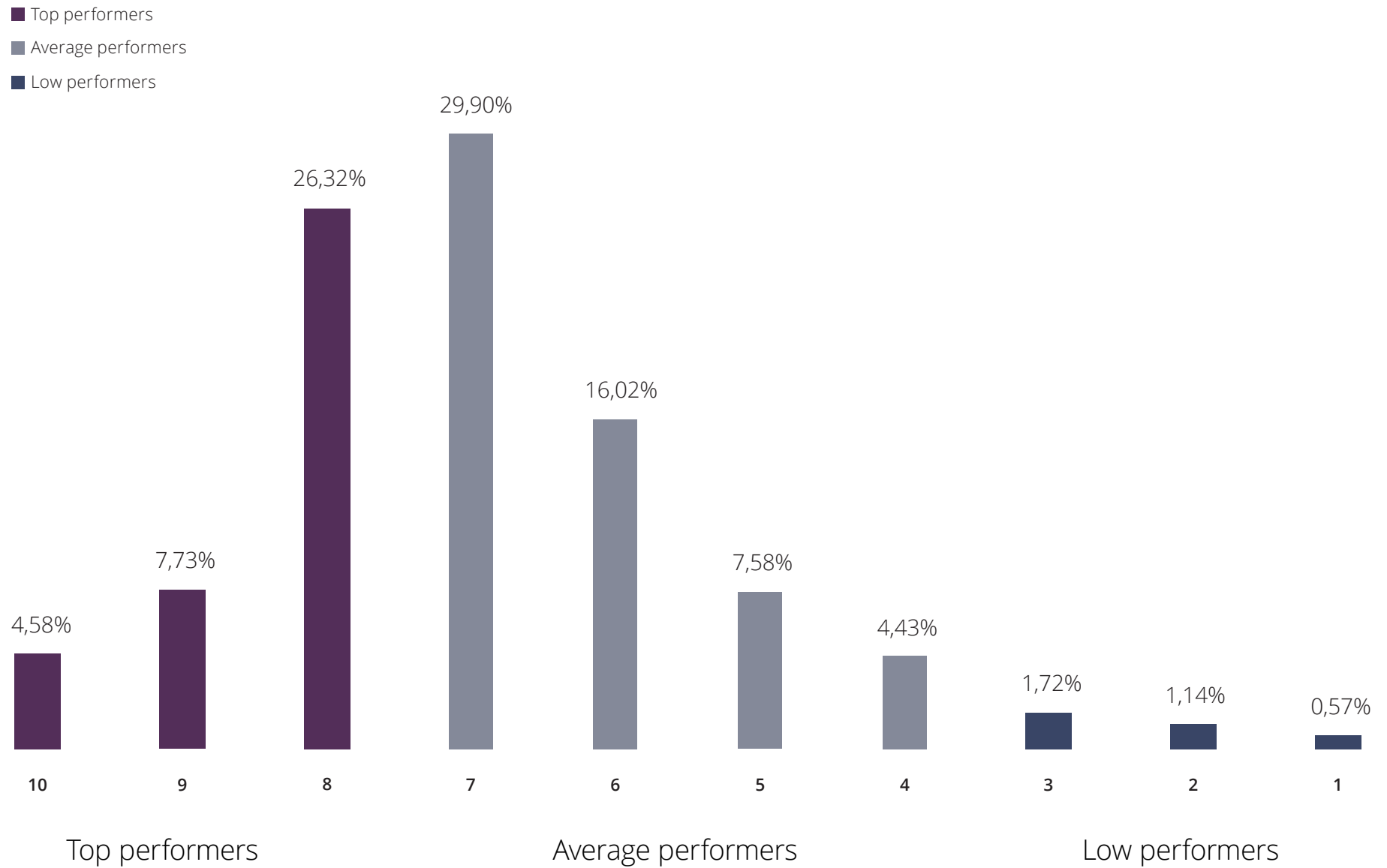


\*We only asked those, who hadn't outsourced software development in the previous 12 months.

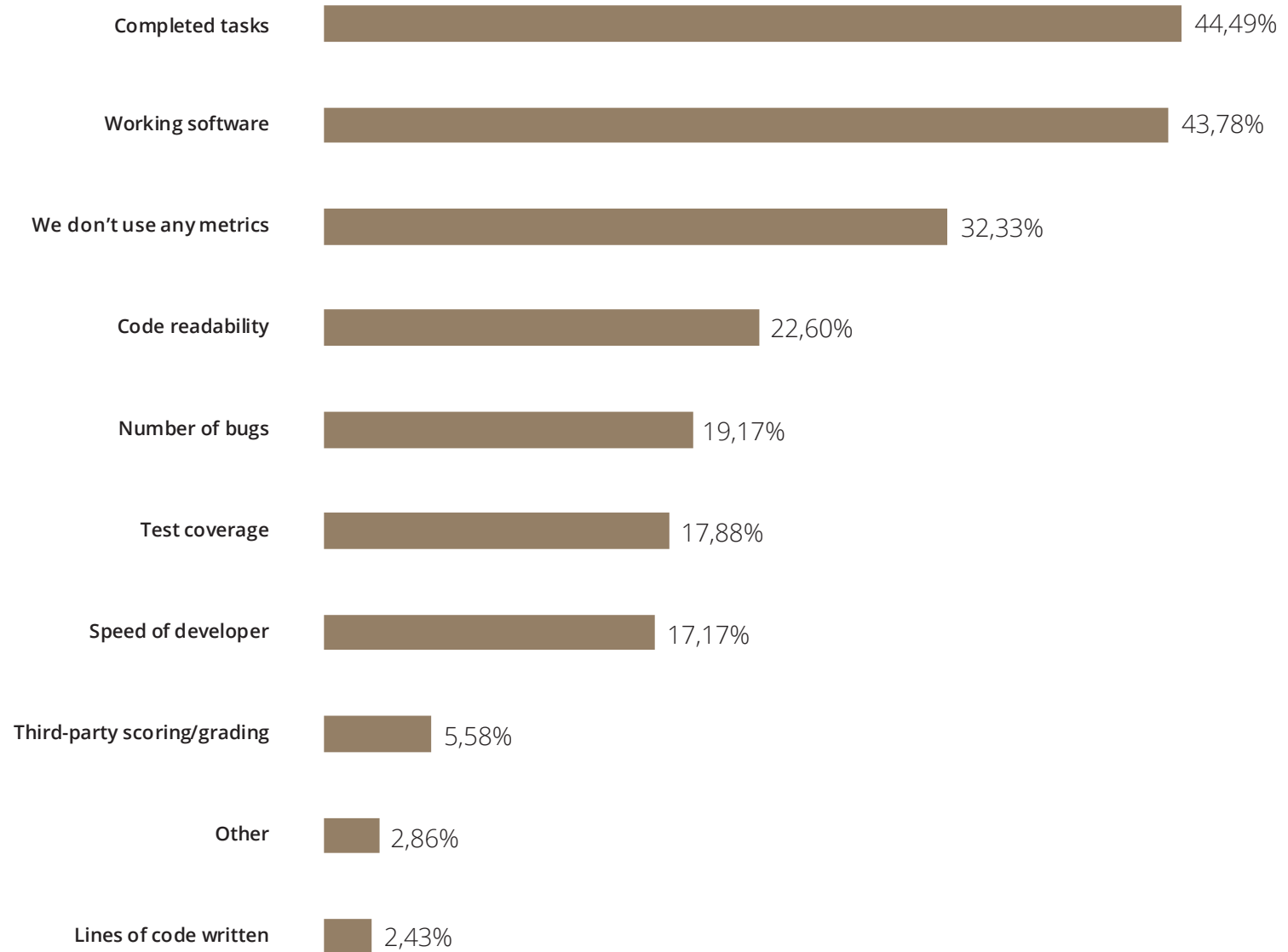
# PERFORMANCE MEASUREMENT

What are the differences between top- and average-performing teams? In this section, we dig deeper into how software teams measure performance and what the number one cause of delivery problems is.

## How effective is software development at your company? (2020)



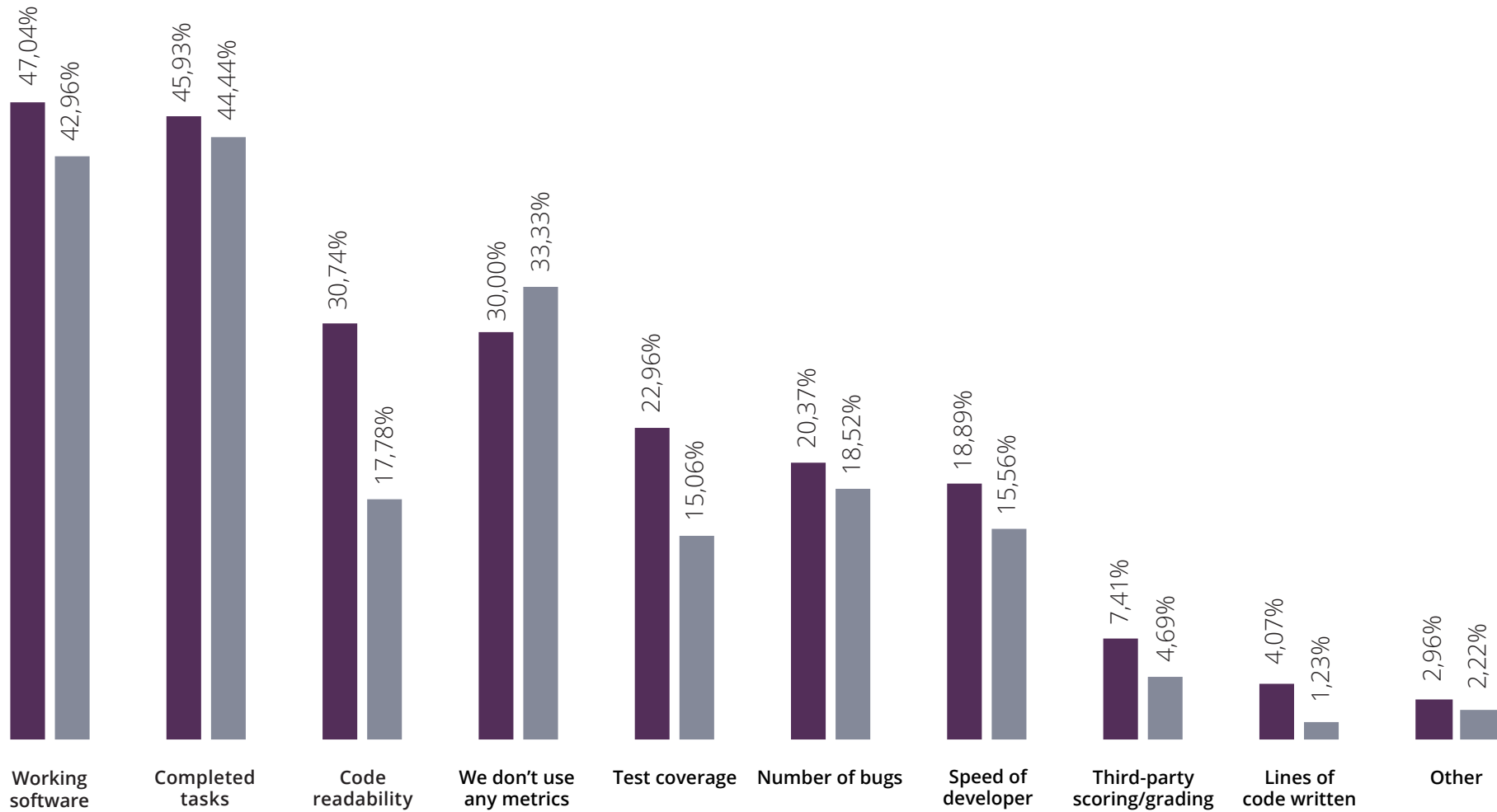
## What metrics do you use to measure developer performance? (2020)



## What metrics do you use to measure developer performance? (2020, top vs average)

■ Top performers

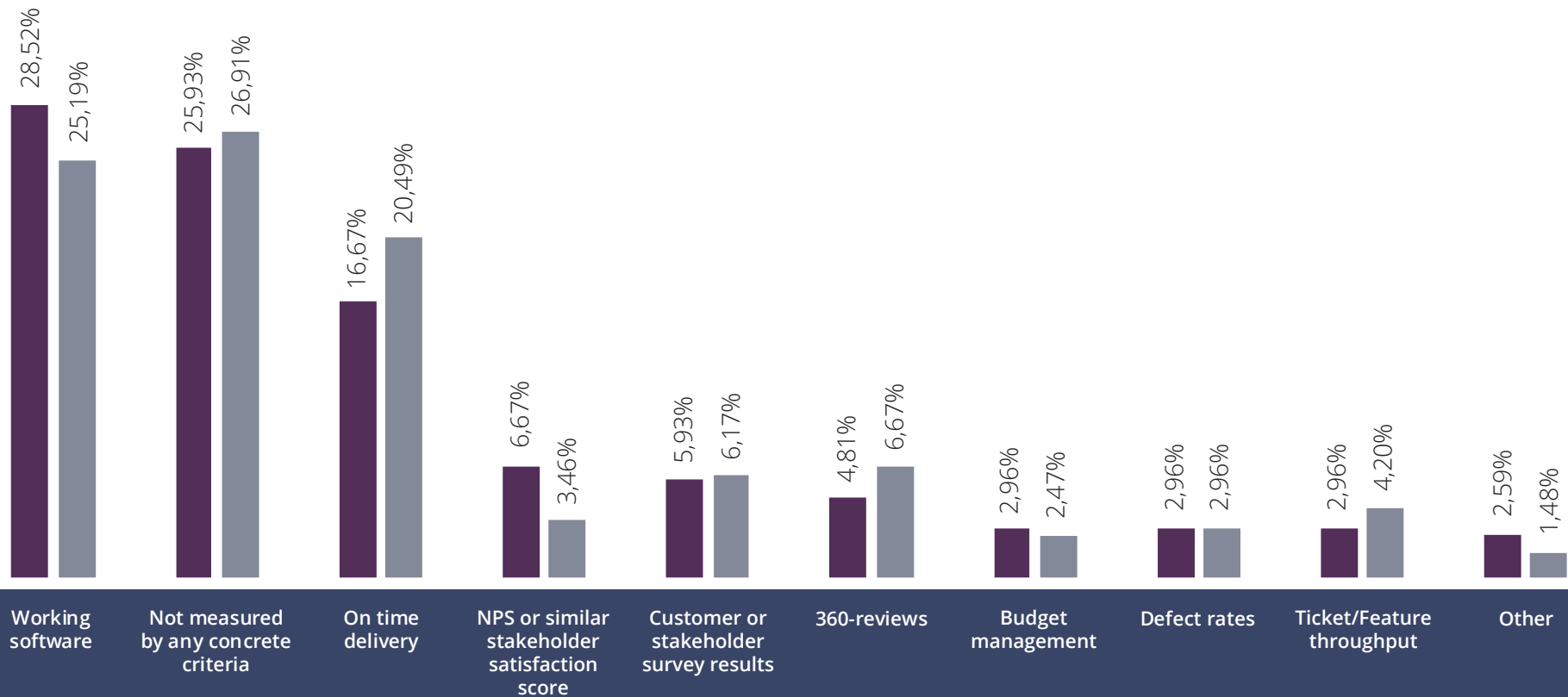
■ Average performers



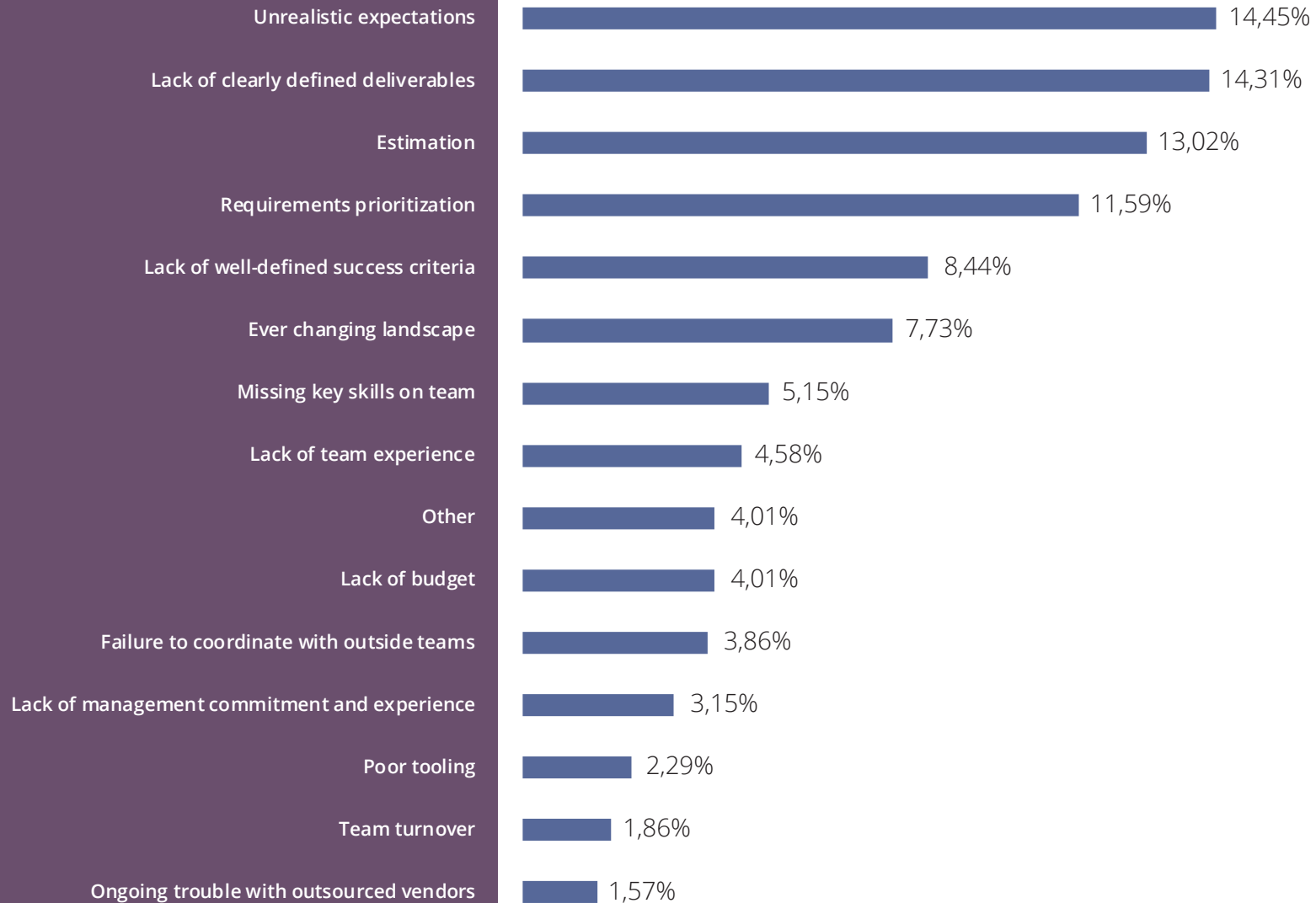
## What is the #1 measured criteria for success of software development managers? (2020, top vs average)

■ Top performers

■ Average performers

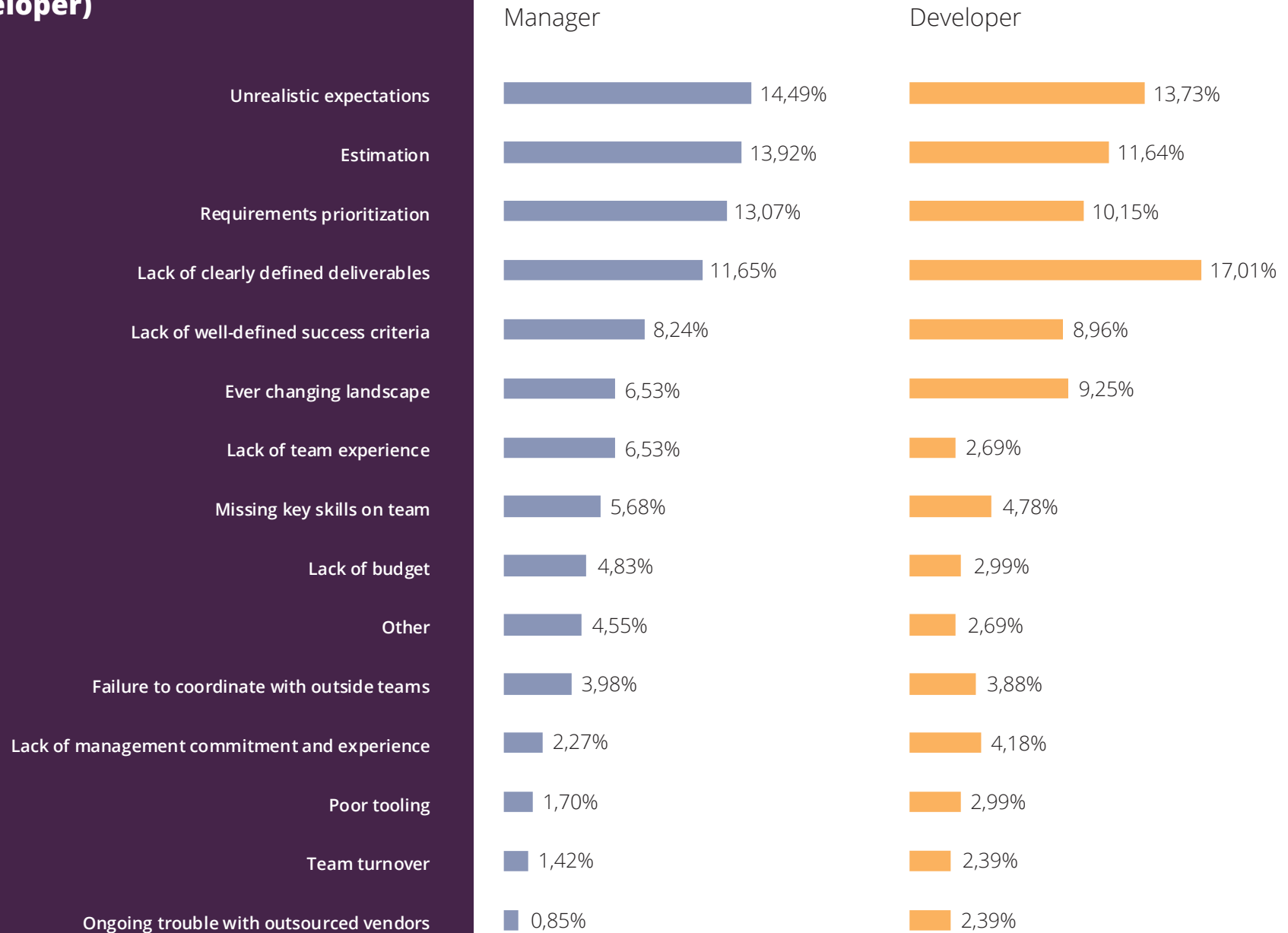


## What is the #1 cause of delivery problems for your team? (2020)

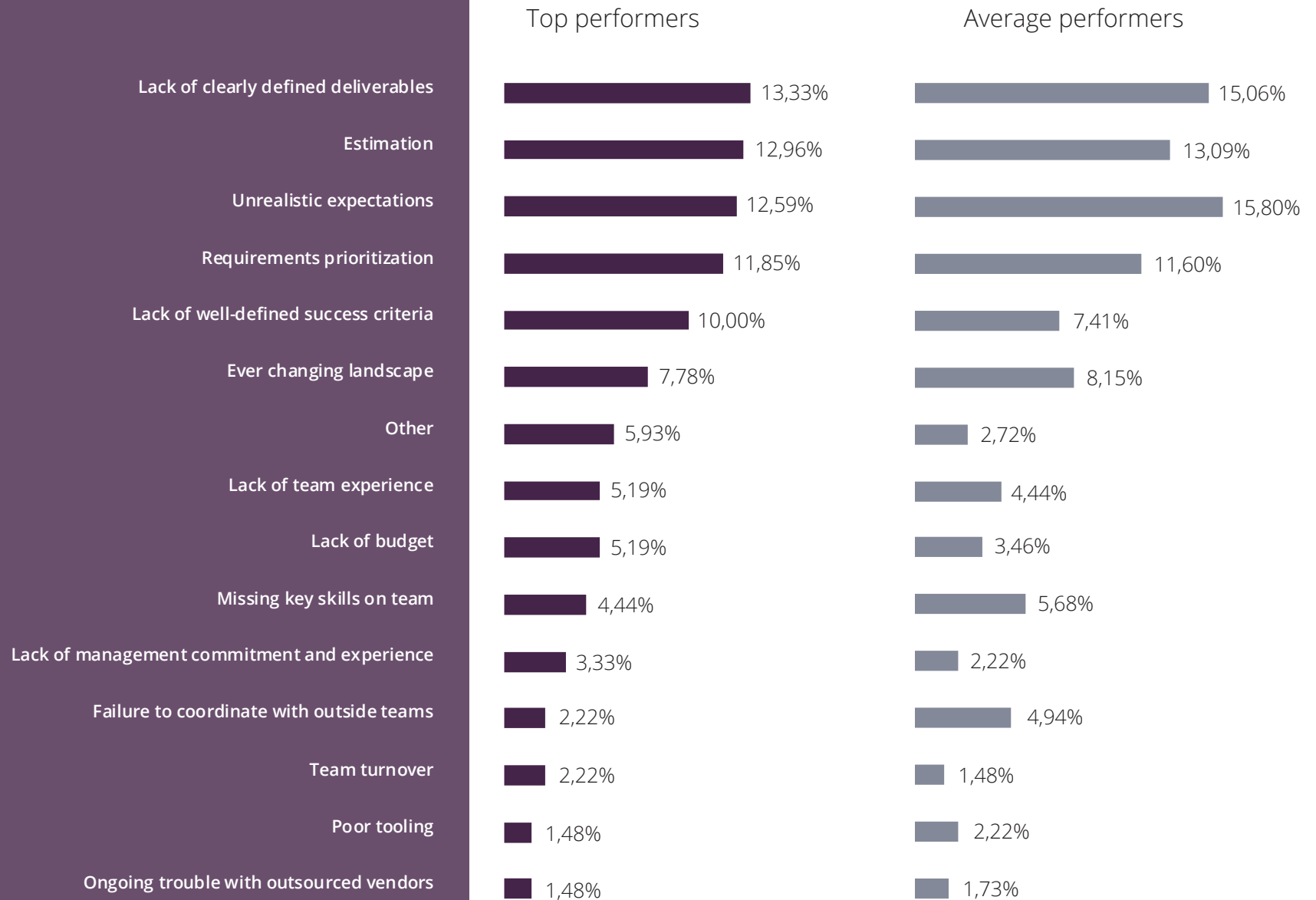




## What is the #1 cause of delivery problems for your team? (manager vs developer)



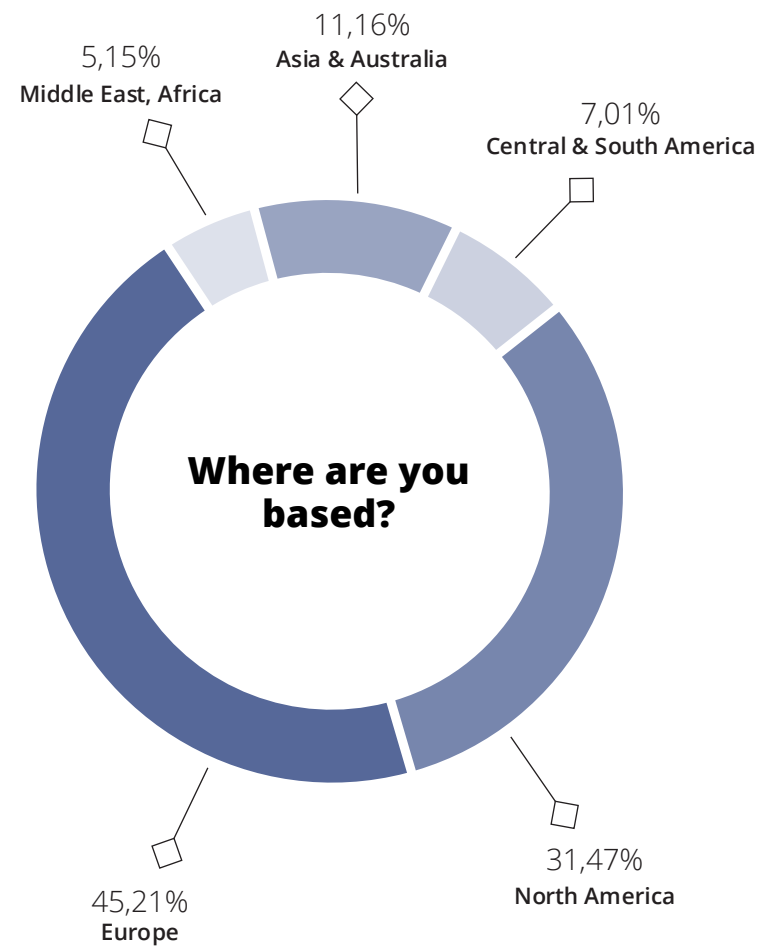
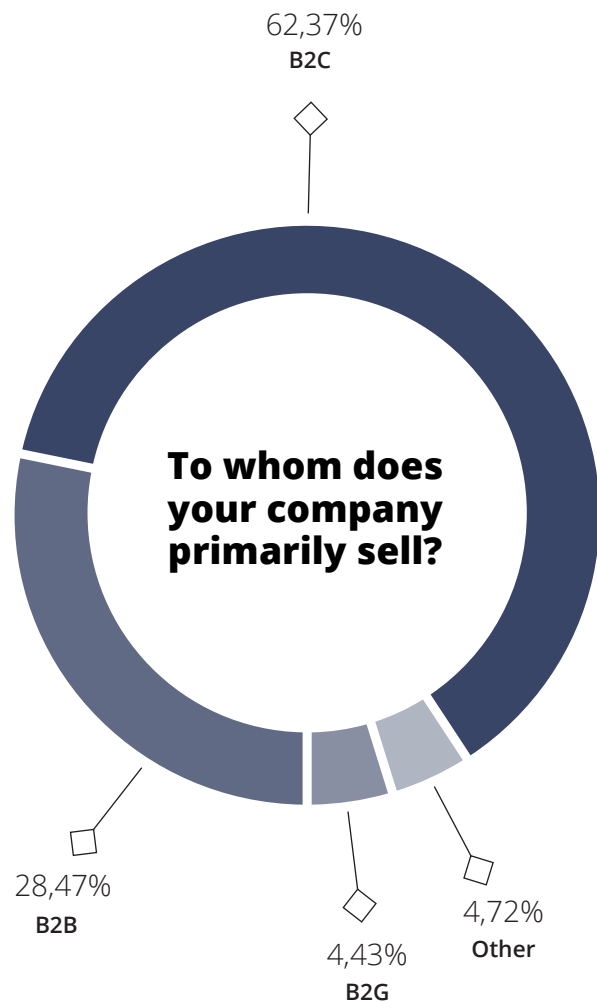
## What is the #1 cause of delivery problems for your team?\* (2020, top vs average)



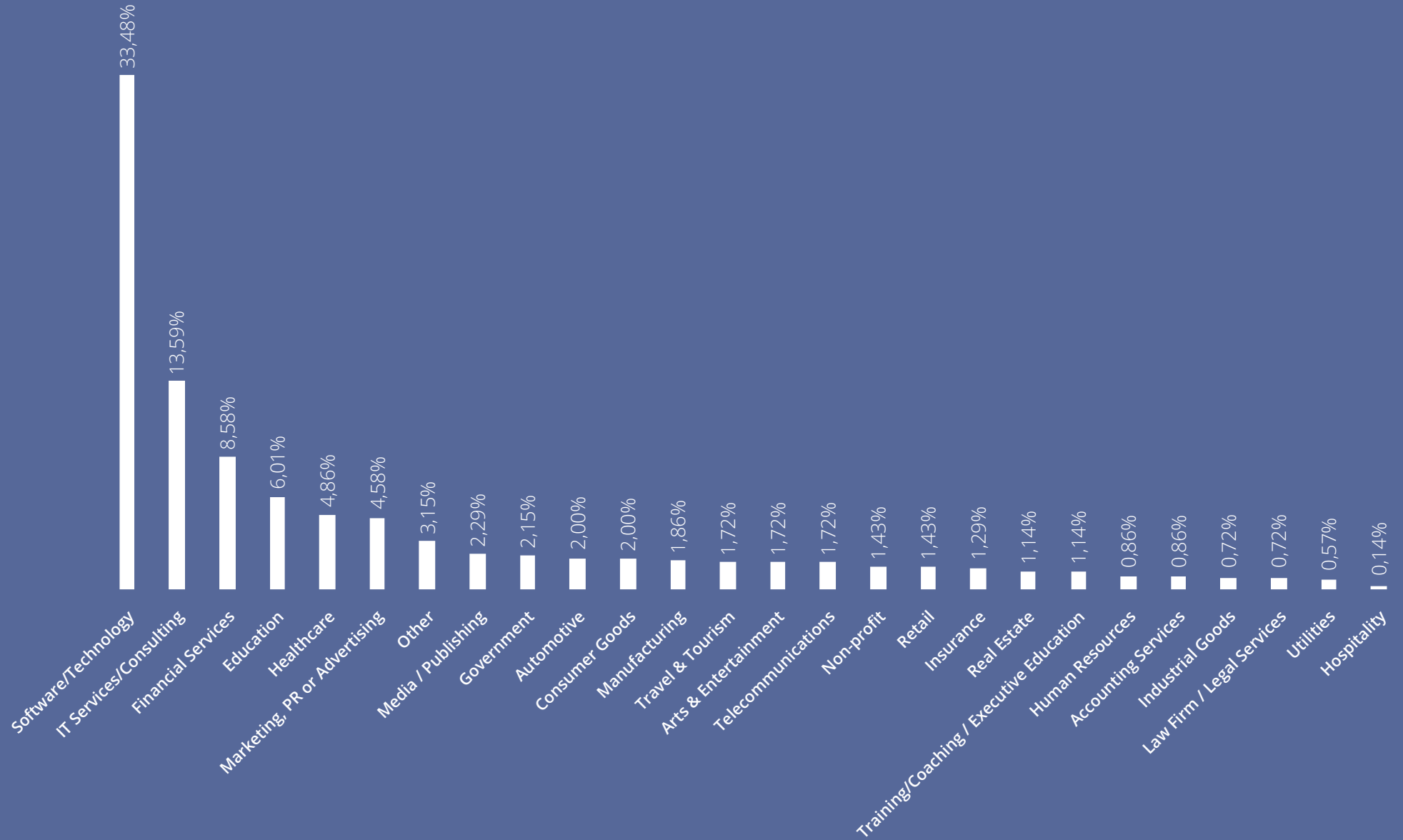
\*Top and average separation is based on a self-evaluating question from page 40.

# ABOUT THIS SURVEY

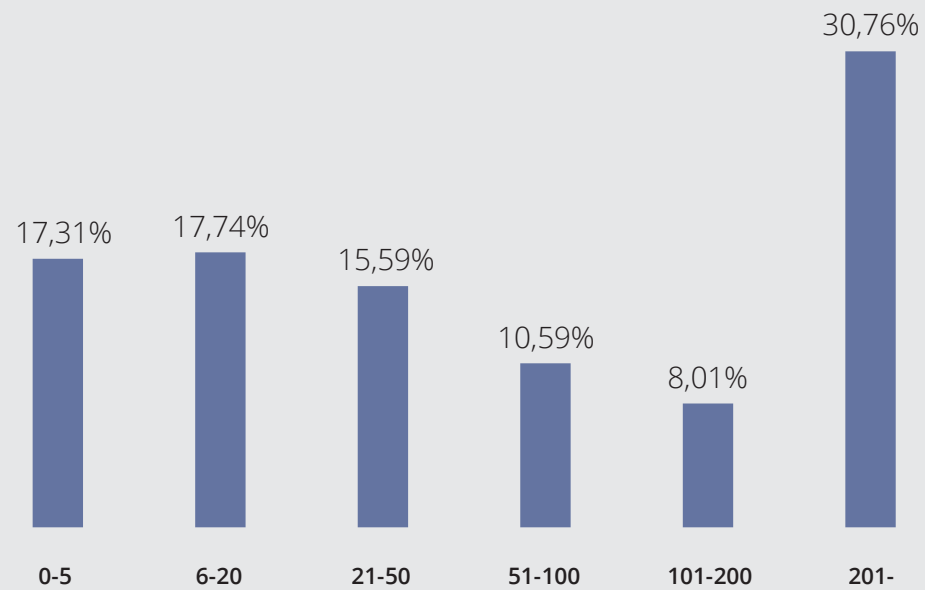
This year's State of Software Development survey had the largest number of respondents: 703 professionals from 81 countries participated. This chapter provides more info about who they are, what kind of company they work for and where they're based.



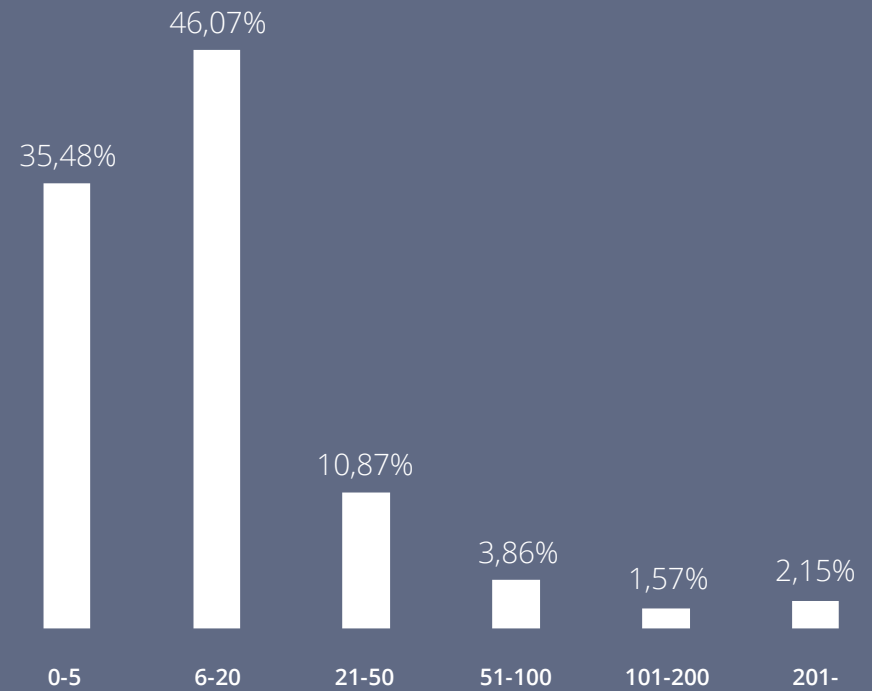
## What industry are you in?



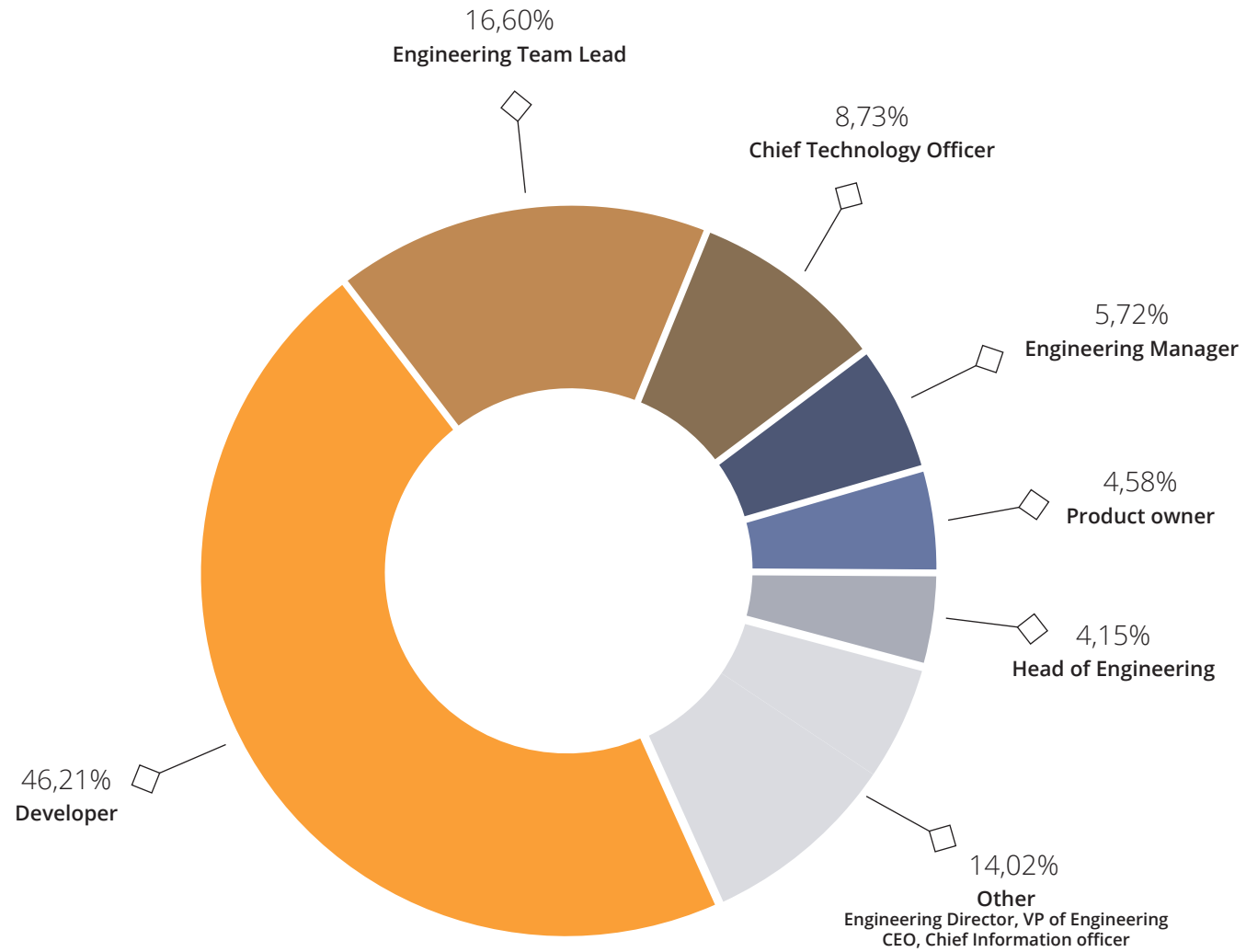
## How many full-time employees does your company have?



## How big is your software team?



## What's your role in your company?



# BYLINES AND METHODOLOGIES

Coding Sans fielded an online survey in cooperation with 9 partner companies from January 2020 until March 11, 2020. The survey was available in English and consisted of 38 questions. The responses were sourced via email invitations, social media, and newsletter promotion with other companies. No personal information was collected within the survey, tool discounts, and eGift cards were offered as incentives to increase survey participation and completion rate.



# NICE TO MEET YOU

Coding Sans is a software development agency, building web applications with Angular and NodeJS.

We're based in Hungary working for companies all around the world.

## **Let's connect:**

Our Facebook page

Yes, Twitter

Our LinkedIn page

**Say hi here:** [info@codingsans.com](mailto:info@codingsans.com)

**Questions & Feedback:** [tamas@codingsans.com](mailto:tamas@codingsans.com)

**Snail mail:** 1051 Budapest, Arany János u. 10., Hungary

**Website:** [www.codingsans.com](http://www.codingsans.com)