In Search of Lost Time:

Developer Productivity in the
Cloud Native Era

Key takeaways

Garden's 2021 Developer Productivity Survey reveals how application developers and DevOps engineers are actually spending their time — **and what they wish they could be doing instead.**

Respondents spend, on average, more than 15 hours every week on tasks outside of writing application code.

From maintaining internal tooling, to setting up dev environments, to debugging pipelines, to waiting for builds and test results. And **54%** of respondents identify **slow feedback loops during the development** process as a major (top 3) frustration.

In the US alone, this time spent could be costing companies up to $61 billion per year*.

Seven in 10 respondents say the time they spend on specific tasks is time wasted and could be put to more strategic use.

49% of these respondents say they would **develop new products and services** to support the company.

46% say they would **improve speed and delivery** of existing products and services.

44% say they would **improve security for existing products** and services.

* Based on median pay and number of software developer jobs in 2019, as reported by the US Bureau of Labor Statistics.

Contents

Introduction

We founded Garden because we were frustrated by the developer experience on Kubernetes. So frustrated, in fact, that we decided to quit our jobs and start a company so we could spend all of our time helping others overcome the problems we'd dealt with.

Our frustration was not something abstract—it was a direct result of all the time we wasted on repetitive work that didn't add any value to the business. Routine tasks like setting up environments, waiting for tests, and troubleshooting CI pipelines took hours every week. We wanted to put all of our energy into building and shipping new products, but we simply couldn't.

Over the past three years, we've spoken to many Garden users and customers who shared our frustrations. We know that staying productive on Kubernetes is a challenge in organizations of all shapes and sizes.

But we wanted to get a better sense of just how big the problem is, to really quantify it—especially outside of the Garden universe. We commissioned this survey to learn more about how developers are spending their time in the cloud native era, what they're struggling with, and where there are opportunities to improve the development process.

About Garden

Garden helps platform teams, DevOps engineers, and SREs to improve the Kubernetes developer experience and speed up tests, builds, and CI pipelines—all without spending a huge amount of time building in-house tools.

Let your Kubernetes developers move faster from the first line of code all the way to production. If you'd like to learn more, feel free to schedule time to talk to us.

Methodology
and respondent profile

Garden engaged Vanson Bourne to field a survey of 400 developers and DevOps team members in the U.S., U.K., and Germany, including: CTOs, VPs and head of departments, director/managers and non-managerial respondents.

The survey was fielded in January-February 2021, with respondents coming from a range of industries, including business and

professional services; financial services; IT, technology and telecoms; manufacturing and production; and retail, distribution and transport. Vanson Bourne rigorously screened interview candidates to ensure suitability and data quality.

Here's an overview of respondents and the types of organizations they work for.

RESPONDENT COUNTRIES

25.0%	25.0%	50.0%
Germany	UK	USA

RESPONDENT SENIORITY

12.3%	53.0%	34.8%
Non-Managerial	Director / Manager level	CTOs, VPs and Heads of Departments

RESPONDENT DEPARTMENT

52.5%	47.5%
Application Development / Software Engineering	DevOps

ORGANIZATION SIZE

250-499 employees	51
500-999 employees	101
1000-2999 employees	109
3000-4,999 employees	101
5000 or more employees	38

ORGANIZATIONAL SECTOR

IT, technology and telecoms	75
Financial services	47
Manufacturing and production	45
Fintech	43
Business and professional services	36
Retail, distribution and transport	35
Other sectors	119

The (multi-) billion dollar question: how are respondents spending their time?

Yes, they're writing code.

But on average, they're also spending more than **15 hours a week** on tasks like setting up internal tooling and dev environments and waiting on tests, builds, and pipelines. **The economic impact to companies could be massive.**

Let's break it down further.

Respondents at organizations not yet using Kubernetes* spend, on average, **14.3 hours every week** writing or maintaining internal tooling, setting up pipelines and automation, waiting for CI pipelines to run, waiting for builds and tests, or setting up dev environments.

And respondents at organizations that are using Kubernetes spend, on average, **16.5 hours every week** on those tasks.

In the US alone, this time spent could be costing companies up to **$61 billion/year****.

And this doesn't even take into consideration the opportunity cost of keeping developers from higher-value work. Imagine the potential if every software developer could reclaim an extra day every week.
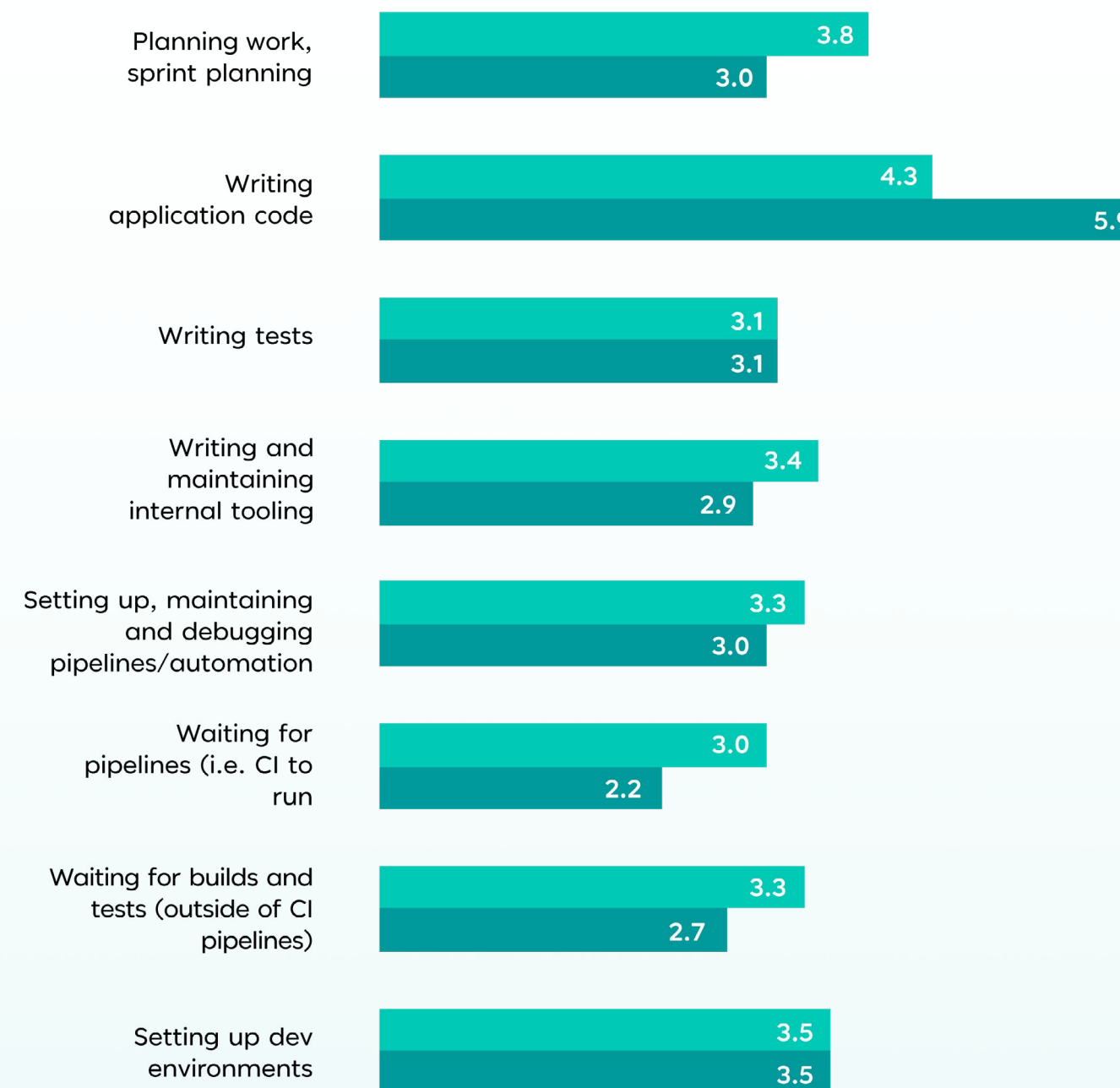
Something that surprised us: there's very little variation in these hours-spent metrics even when segmenting the data by respondent department (Application Development & SWE vs. DevOps) and seniority level (CTOs, VPs and Head of Department vs. Director/Manager vs. Non-managerial).

Despite the promise of DevOps to enable greater focus and productivity for developers, respondents at all levels and across departments are spending more than a working day and a half every week on work outside of writing code.

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* "Not Using Kubernetes" respondents are those who described Kubernetes adoption at their org as "We are not planning to adopt it" or "We are trying it out/evaluating it." "Using Kubernetes" respondents are those who described Kubernetes adoption at their org as "We are using it for development", "We are partially running it in production", or "We are fully running it in production." These segments exclude the 5 users who responded "Don't know" when asked to describe their org's Kubernetes adoption.

** Based on median pay and number of software developer jobs as reported by the US Bureau of Labor Statistics

HOW MANY HOURS PER WEEK ARE SPENT ON THE FOLLOWING TASKS (ON AVERAGE)?

Task	Using Kubernetes	Not using Kubernetes
Planning work, sprint planning	3.8	3.0
Writing application code	4.3	5.9
Writing tests	3.1	3.1
Writing and maintaining internal tooling	3.4	2.9
Setting up, maintaining and debugging pipelines/automation	3.3	3.0
Waiting for pipelines (i.e. CI to run	3.0	2.2
Waiting for builds and tests (outside of CI pipelines)	3.3	2.7
Setting up dev environments	3.5	3.5

■ **Using Kubernetes** (249 respondents)   ■ **Not using Kubernetes** (146 respondents)

Satisfaction with **development setups**

Only 11% of all respondents are completely happy with their development setups and workflows, suggesting they don't think there's any room for improvement.

That makes sense. Developers are problem solvers at heart. It's no surprise they're always thinking of ways they can improve the status quo.

But only 2% of non-managers are completely happy with their development setups.

Not only that, but non-managers are nearly twice as likely as managers to say there's **"noticeable room for improvement"** in their development setups and workflows.

We take this as a sign of a meaningful disconnect between individual contributors and their supervisors on the state of the software development process.
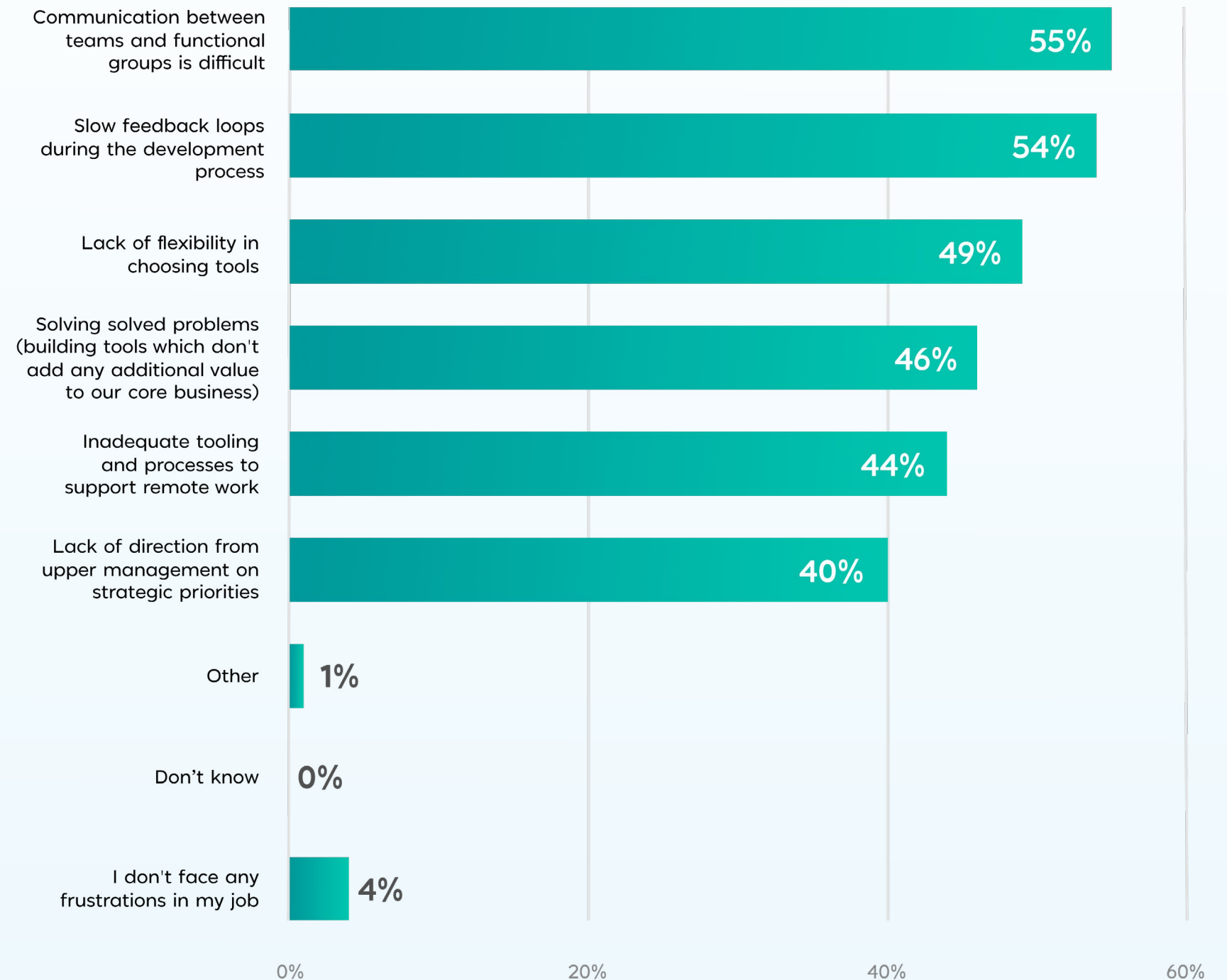
Top frustrations:
communication challenges and slow feedback loops

We asked respondents to rank the top 3 things that cause them the most frustration at their job. 55% of respondents identified **difficult communication** between teams and functional groups, closely followed by 54% citing **slow feedback loops** during the development process.

> And "slow feedback loops during the development process" was the frustration that was most frequently ranked #1, **with 20% of respondents ranking it as their top frustration.**

This frustration makes sense, considering the sheer number of hours respondents spend setting up and waiting for pipelines, waiting for builds and tests, and setting up development environments.

WHICH OF THE FOLLOWING CAUSE THE MOST FRUSTRATION IN YOUR JOB?

Category	Percentage
Communication between teams and functional groups is difficult	55%
Slow feedback loops during the development process	54%
Lack of flexibility in choosing tools	49%
Solving solved problems (building tools which don't add any additional value to our core business)	46%
Inadequate tooling and processes to support remote work	44%
Lack of direction from upper management on strategic priorities	40%
Other	1%
Don't know	0%
I don't face any frustrations in my job	4%

All the time spent on low-value tasks?
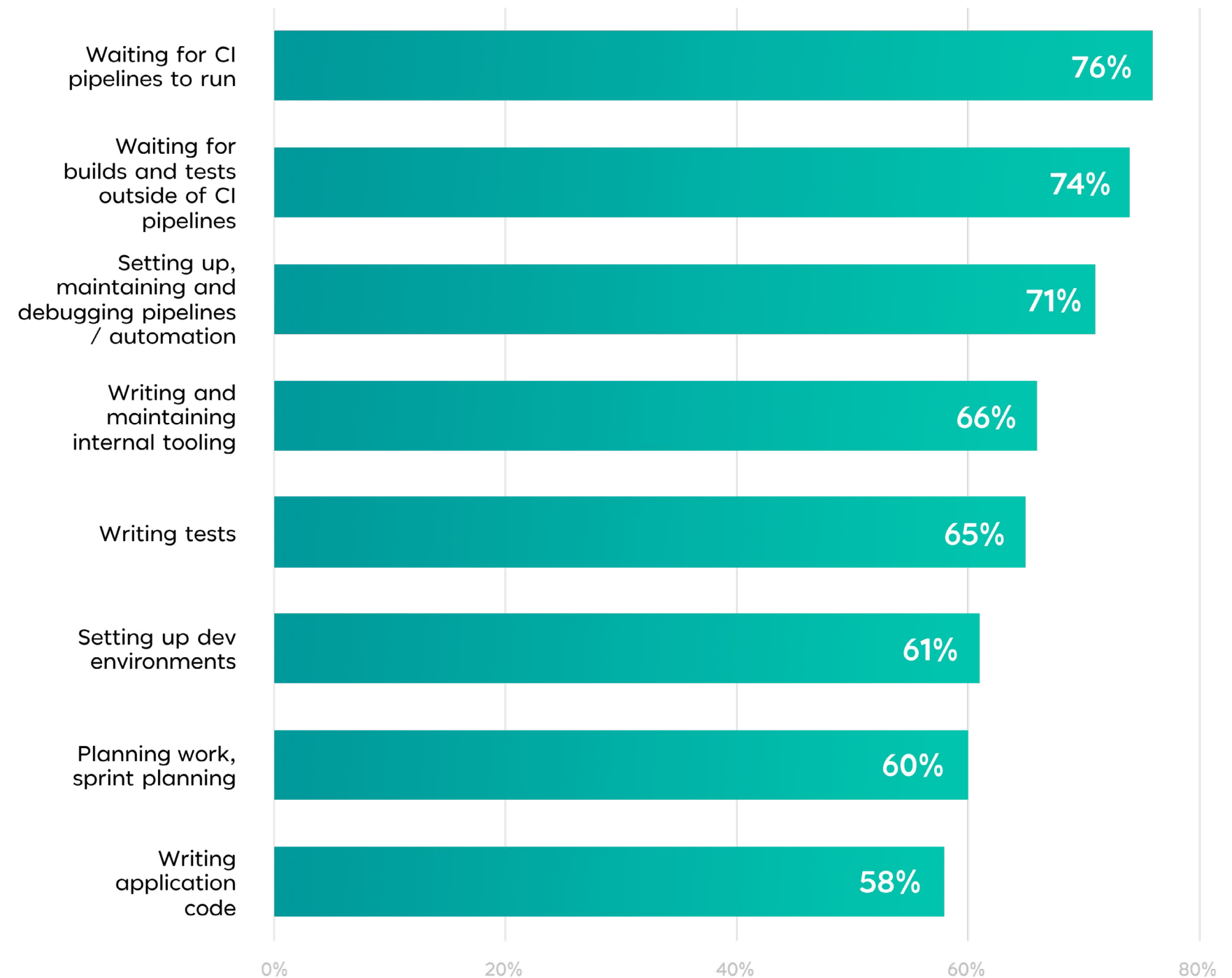
That's causing its fair share of frustration, too.

After finding out how much time respondents were spending on different tasks, we asked which tasks were causing them frustration*.

Even writing application code is frustrating for a majority of respondents, though far more are frustrated by sitting around and waiting for pipelines, tests, and builds and setting up and maintaining pipelines and internal tooling.

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* The survey asked, "What level of frustration do you feel with the following tasks?" and this chart shows the proportion of respondents who selected "Very frustrated", "Moderately frustrated" or "A little frustrated".

PERCENTAGE OF RESPONDENTS FRUSTRATED BY DAILY TASKS

Task	Percentage
Waiting for CI pipelines to run	76%
Waiting for builds and tests outside of CI pipelines	74%
Setting up, maintaining and debugging pipelines / automation	71%
Writing and maintaining internal tooling	66%
Writing tests	65%
Setting up dev environments	61%
Planning work, sprint planning	60%
Writing application code	58%

How do respondents wish they were spending their time?
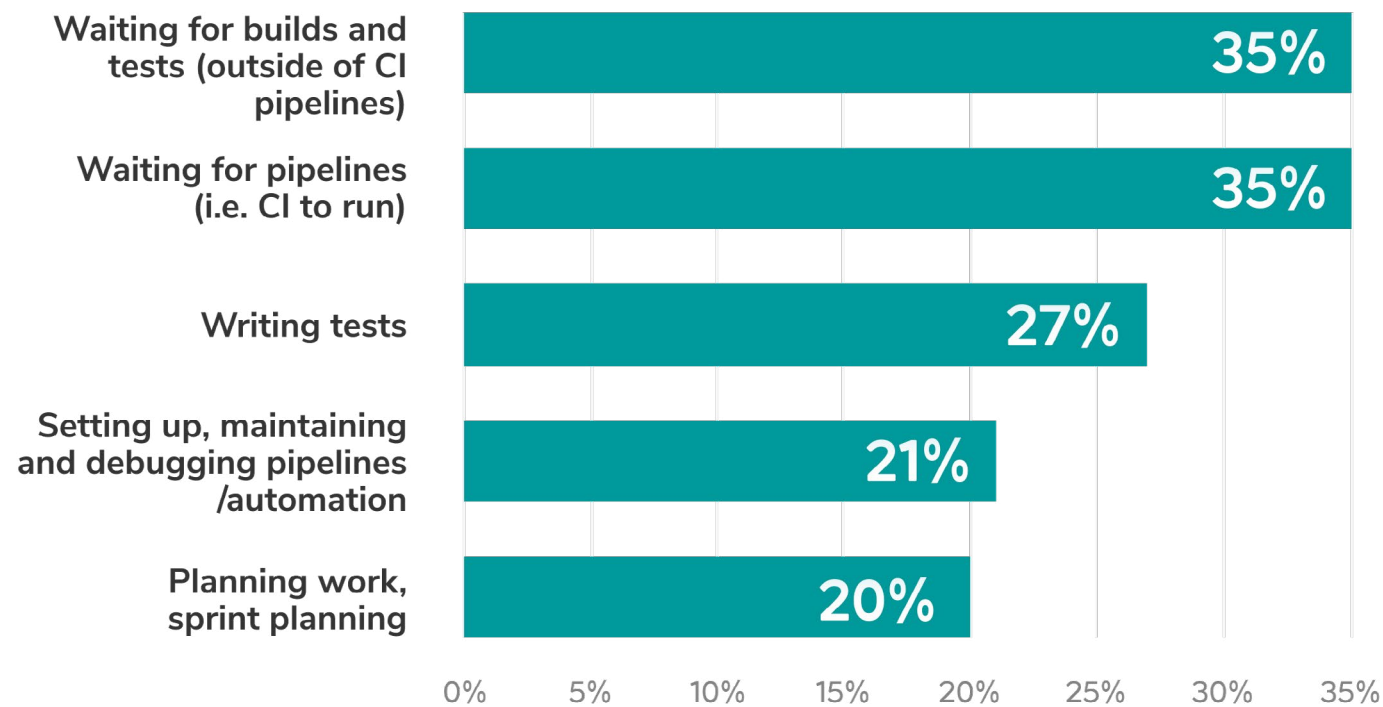
A clear majority of respondents acknowledge they're not spending their time as effectively as they could.

In fact, more than 75% of respondents say the time they spend on specific tasks is time wasted, suggesting it could be put to more strategic use.

It's not just frustration—respondents recognize that the way they're spending their time has a real impact on the business.

Respondents also have a clear sense of what they'd rather be spending their time on: tasks that directly support the company's bottom line.

49% of these respondents would **develop new products and services** to support the company.

44% would **improve security** for existing products and services.

46% would **improve speed and delivery** of existing products and services.

WHICH OF THE TASKS DO YOU CONSIDER TO BE TIME WASTED? (TOP 5 RESPONSES)

Task	%
Waiting for builds and tests (outside of CI pipelines)	35%
Waiting for pipelines (i.e. CI to run)	35%
Writing tests	27%
Setting up, maintaining and debugging pipelines /automation	21%
Planning work, sprint planning	20%

BECAUSE OF THE TIME WASTED ON THESE TASKS, WHICH OF THE FOLLOWING ARE YOU UNABLE TO SPEND THE DESIRED AMOUNT OF TIME ON?

Task	%
Developing new products and services to support the company	49%
Improving speed and delivery of existing products and services	46%
Improving security for existing products and services	44%
Finding creative solutions to overcome business problems	44%
Training and/or professional development to improve skillsets	42%
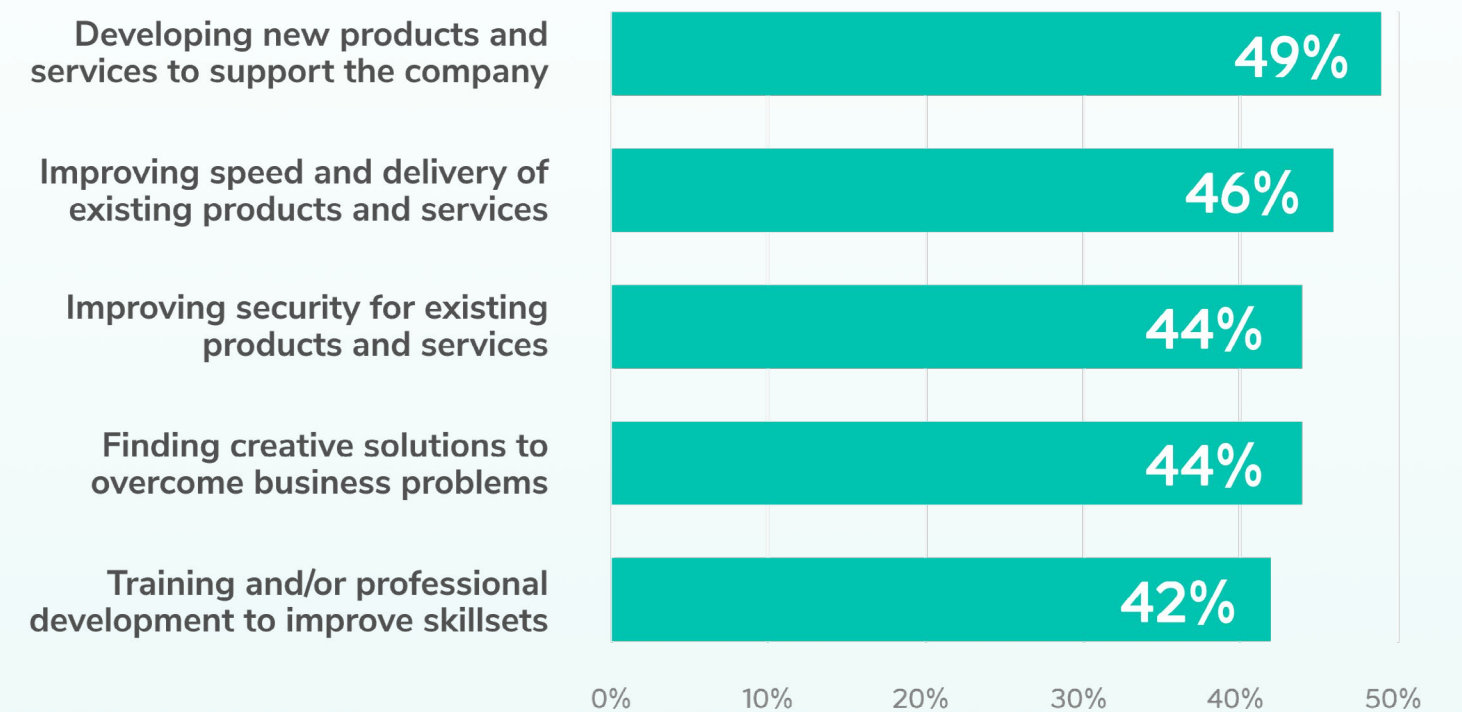
What's the impact of a platform team...if any?

We also asked respondents whether different tools were...

- Centrally managed and configured (e.g. by a platform team)
- Individually managed and operated (e.g. by each application team)
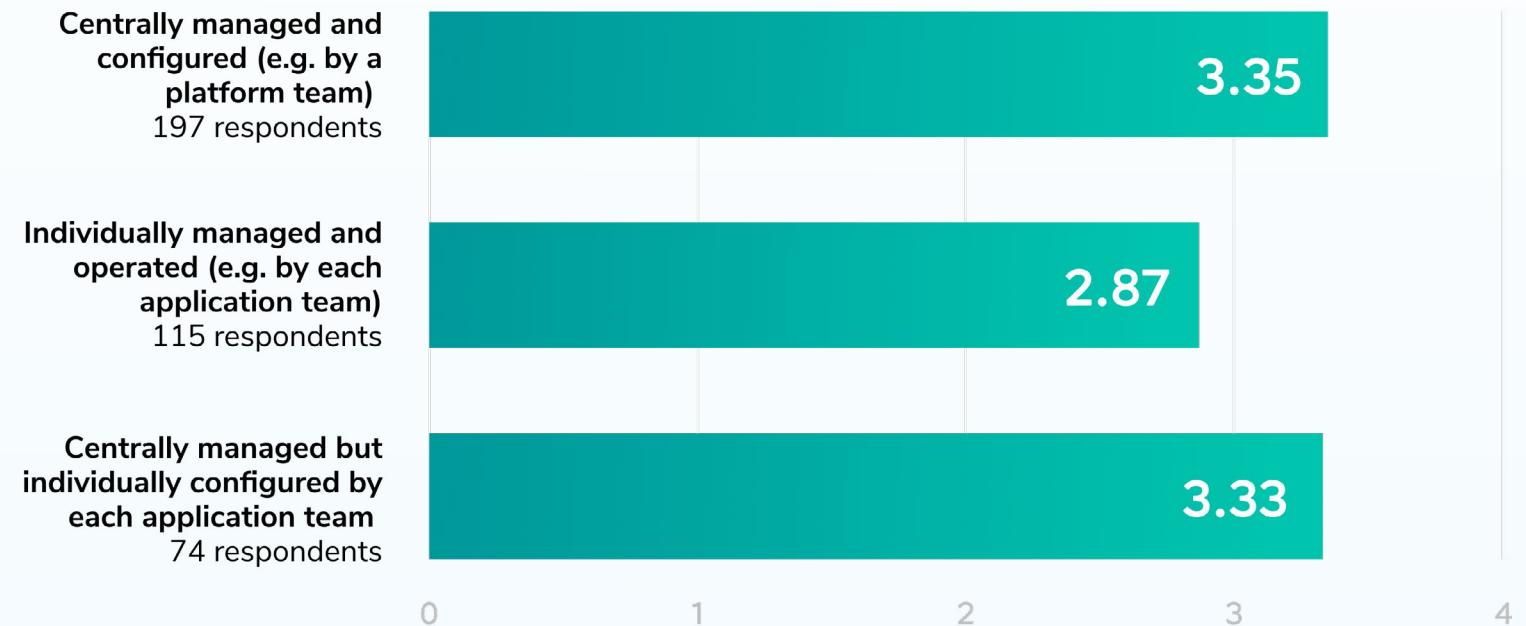- Centrally managed but individually configured by each application team

This gave us an interesting opportunity to break out "time spent" data based on how different tools are managed and configured.

Our hypothesis was that respondents from organizations that used a platform team to administer various tools would, in turn, spend less time dealing with those tools themselves.

But that's not what we found in the data! In both of the two cases we examined, having a platform team manage and configure a tool did not have a meaningful impact on the amount of time spent managing that tool.

There's nothing wholly conclusive to say about this, but it's definitely a finding we'd like to explore further in our conversations with users and customers.

HOW MANY HOURS PER WEEK ARE SPENT SETTING UP, MAINTAINING AND DEBUGGING PIPELINES/AUTOMATION IF CI/CD IS...

Centrally managed and configured (e.g. by a platform team)
197 respondents
3.35

Individually managed and operated (e.g. by each application team)
115 respondents
2.87

Centrally managed but individually configured by each application team
74 respondents
3.33

0   1   2   3   4

HOW MANY HOURS PER WEEK SPENT SETTING UP DEV ENVIRONMENTS IF DEV / TESTING ENVIRONMENTS ARE...

Centrally managed and configured (e.g. by a platform team)
163 respondents
3.54

Individually managed and operated (e.g. by each application team)
149 respondents
3.25

Centrally managed but individually configured by each application team
84 respondents
3.73

0   1   2   3   4
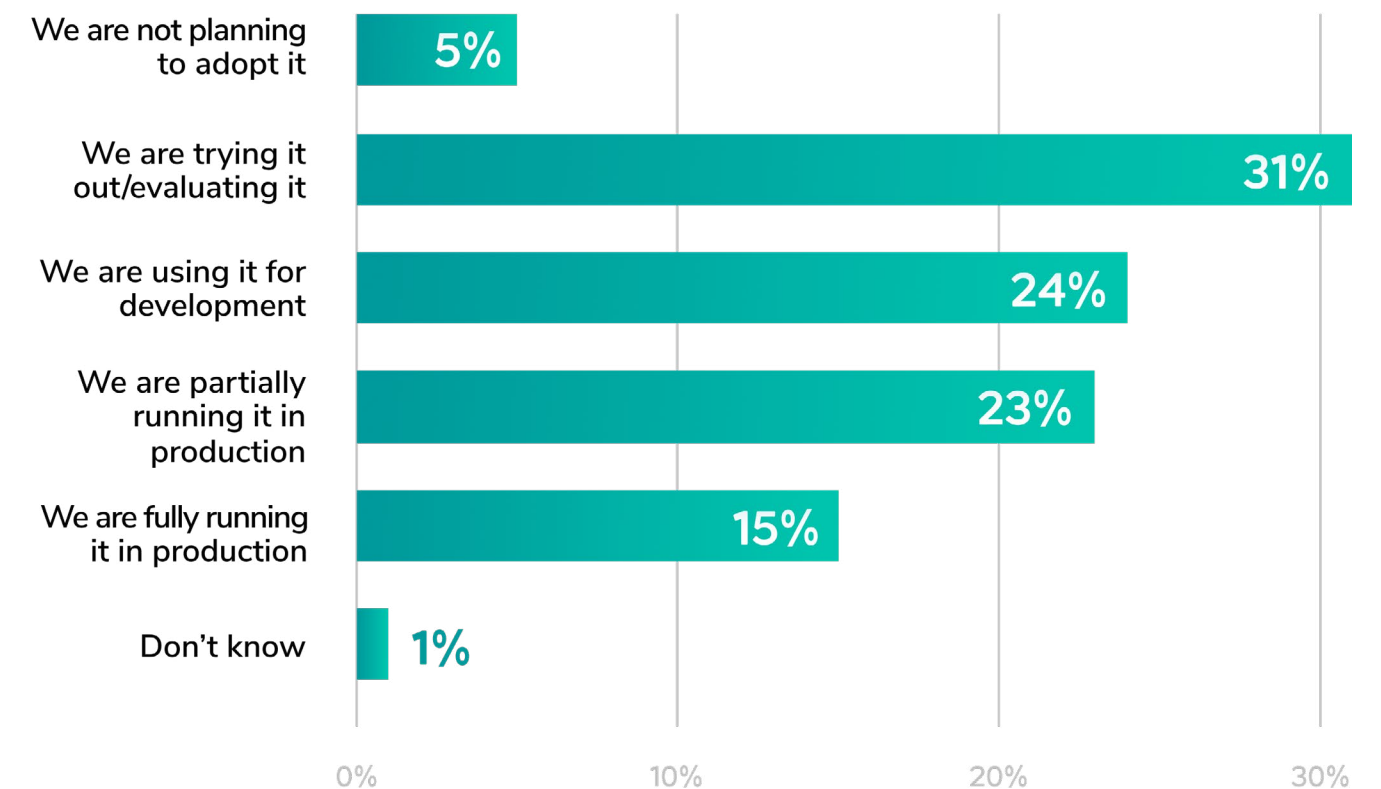
Kubernetes adoption and Day 2 challenges

We've already looked at time spent on different tasks for broader segments of respondents whose organizations are using Kubernetes vs. not using Kubernetes. But let's take a closer look at Kubernetes adoption stage.

We found that::

Only **5%** of respondent organizations are not planning to use Kubernetes.

39% are running Kubernetes partially or fully in production.

HOW WOULD YOU DESCRIBE YOUR ORGANIZATION'S ADOPTION OF KUBERNETES?

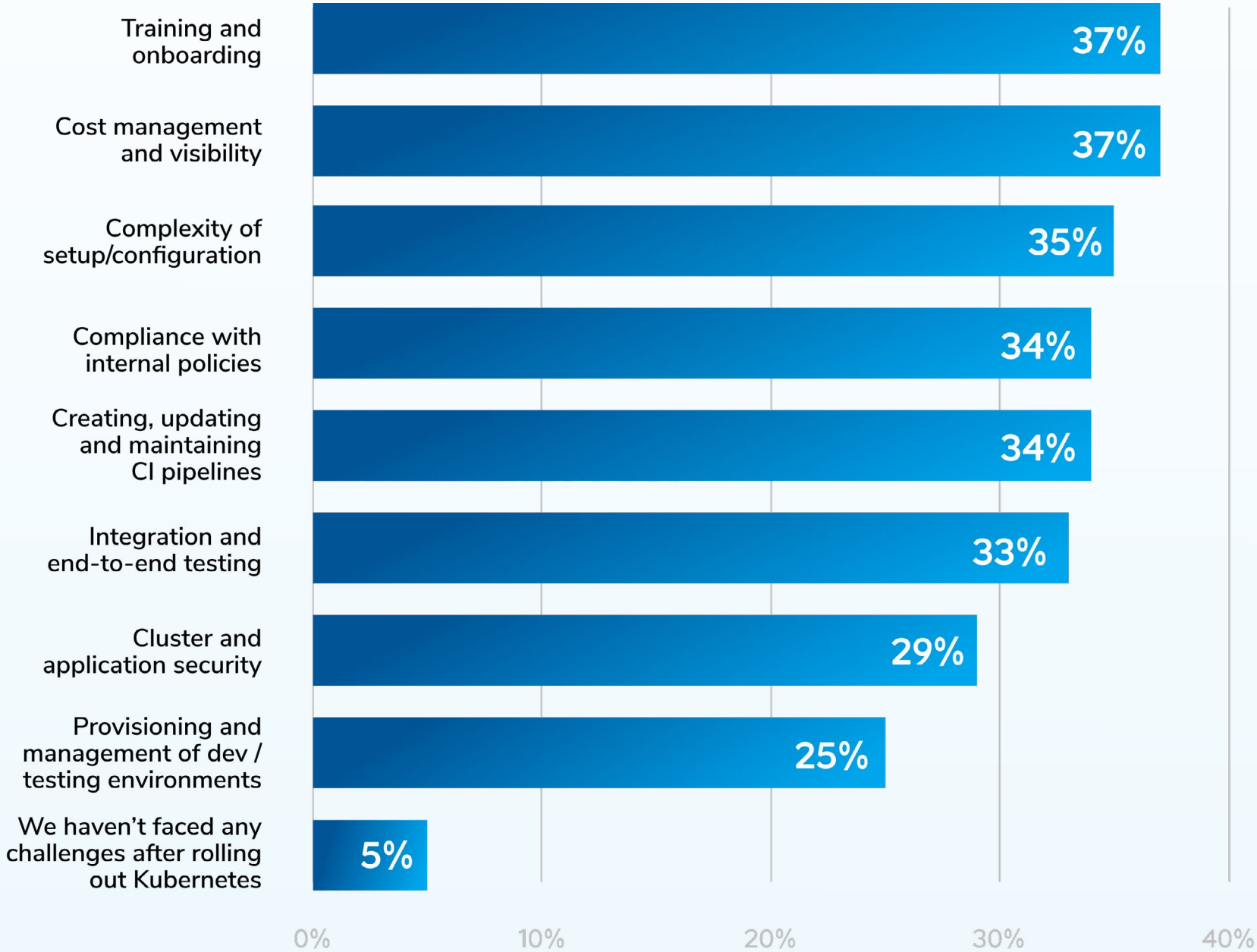| Category	Percentage
We are not planning to adopt it	5%
We are trying it out/evaluating it	31%
We are using it for development	24%
We are partially running it in production	23%
We are fully running it in production	15%
Don't know	1%

And as expected, rolling out Kubernetes to development teams is not without challenges (well, except for 5% of respondents—and we tip our hats to you).

We found it interesting that respondents identify such a broad variety of challenges—from training, to cost visibility, to general complexity of the setup, to CI and testing—with no single challenge identified by a majority of respondents.

Base: organizations which are using Kubernetes for development, partially running it in production, or fully running it in production [249]

WHAT ARE THE BIGGEST CHALLENGES YOUR ORGANIZATION FACES AFTER ROLLING OUT KUBERNETES TO ITS DEVELOPMENT TEAM(S)?

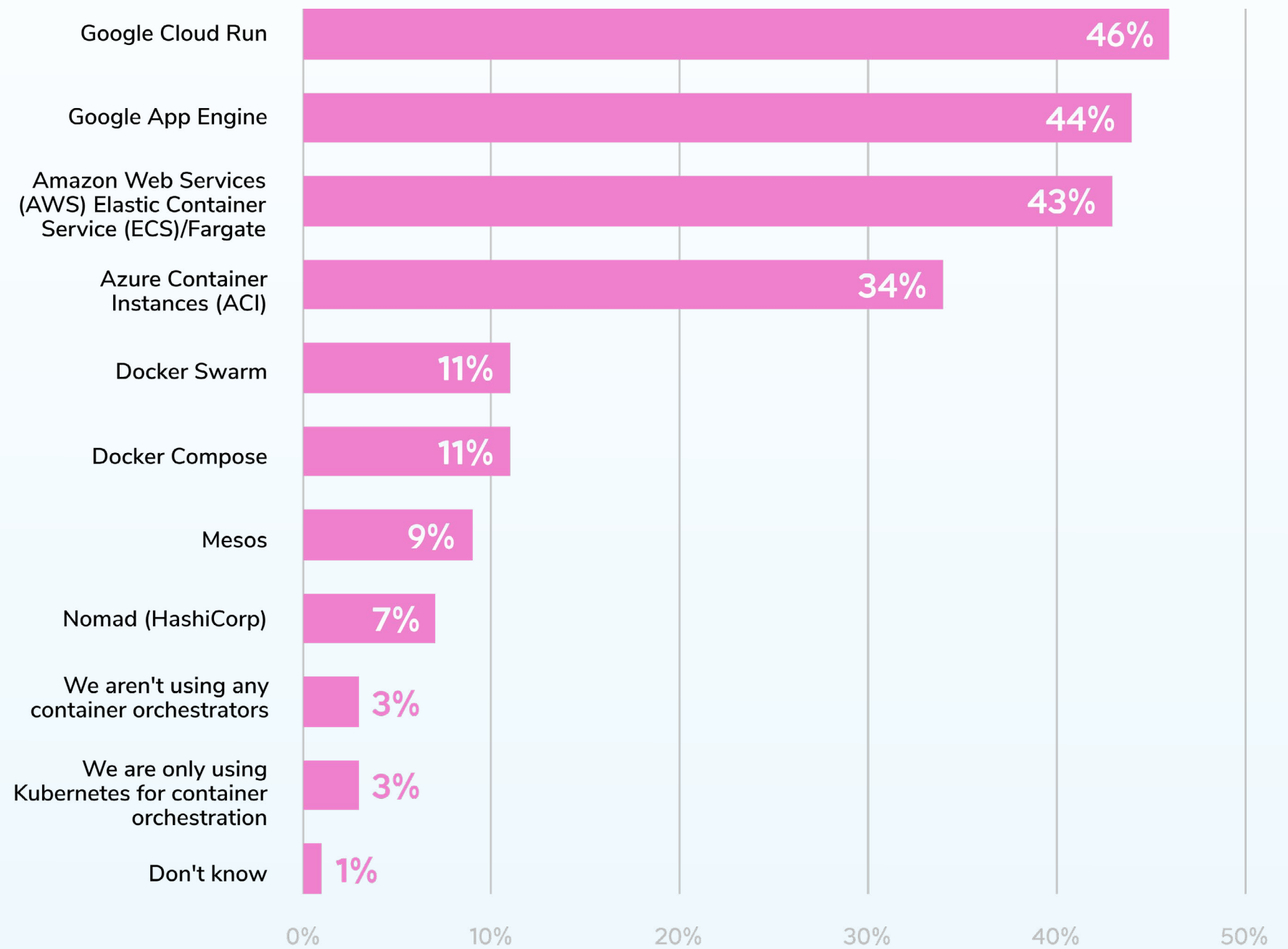| Challenge	Percentage
Training and onboarding	37%
Cost management and visibility	37%
Complexity of setup/configuration	35%
Compliance with internal policies	34%
Creating, updating and maintaining CI pipelines	34%
Integration and end-to-end testing	33%
Cluster and application security	29%
Provisioning and management of dev / testing environments	25%
We haven't faced any challenges after rolling out Kubernetes	5%

But it's not only Kubernetes: a look at other container orchestrators

Also notable is the fact that respondents aren't only using Kubernetes for container orchestration—there are many other orchestrators in the mix.

Google's serverless offerings have a particularly strong share amongst our respondent base, followed by those from Amazon and Microsoft.

It's a meaningful datapoint for tools like Garden that seek to improve cloud native developer productivity. Beyond Kubernetes, where do such tools need to be able to integrate with a developer's day-to-day workflow?

WHICH, IF ANY, OF THE FOLLOWING CONTAINER ORCHESTRATOR(S) ARE IN USE IN YOUR ORGANIZATION?

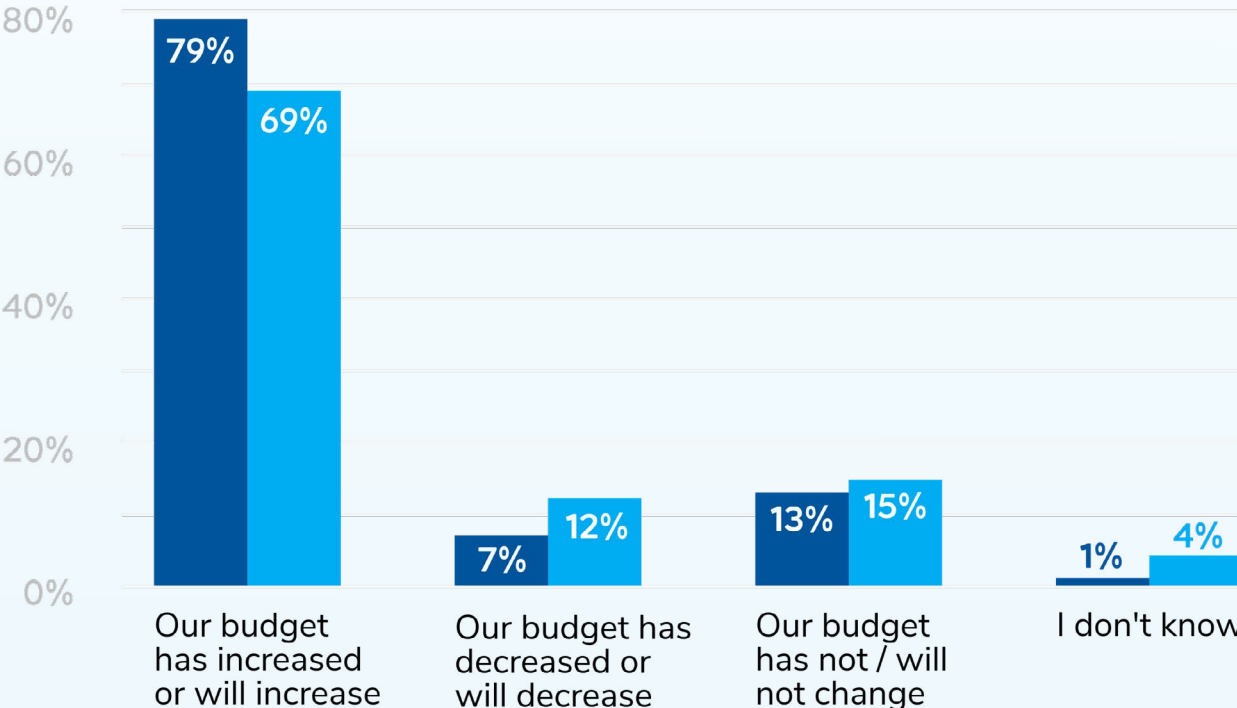| Orchestrator	Percentage
Google Cloud Run	46%
Google App Engine	44%
Amazon Web Services (AWS) Elastic Container Service (ECS)/Fargate	43%
Azure Container Instances (ACI)	34%
Docker Swarm	11%
Docker Compose	11%
Mesos	9%
Nomad (HashiCorp)	7%
We aren't using any container orchestrators	3%
We are only using Kubernetes for container orchestration	3%
Don't know	1%

A look ahead: budgets and hiring in 2021

We still have a long way to go before we reach DevOps nirvana, that magical place where developers no longer waste hours every week on low-value work and development workflows are free of frustration.
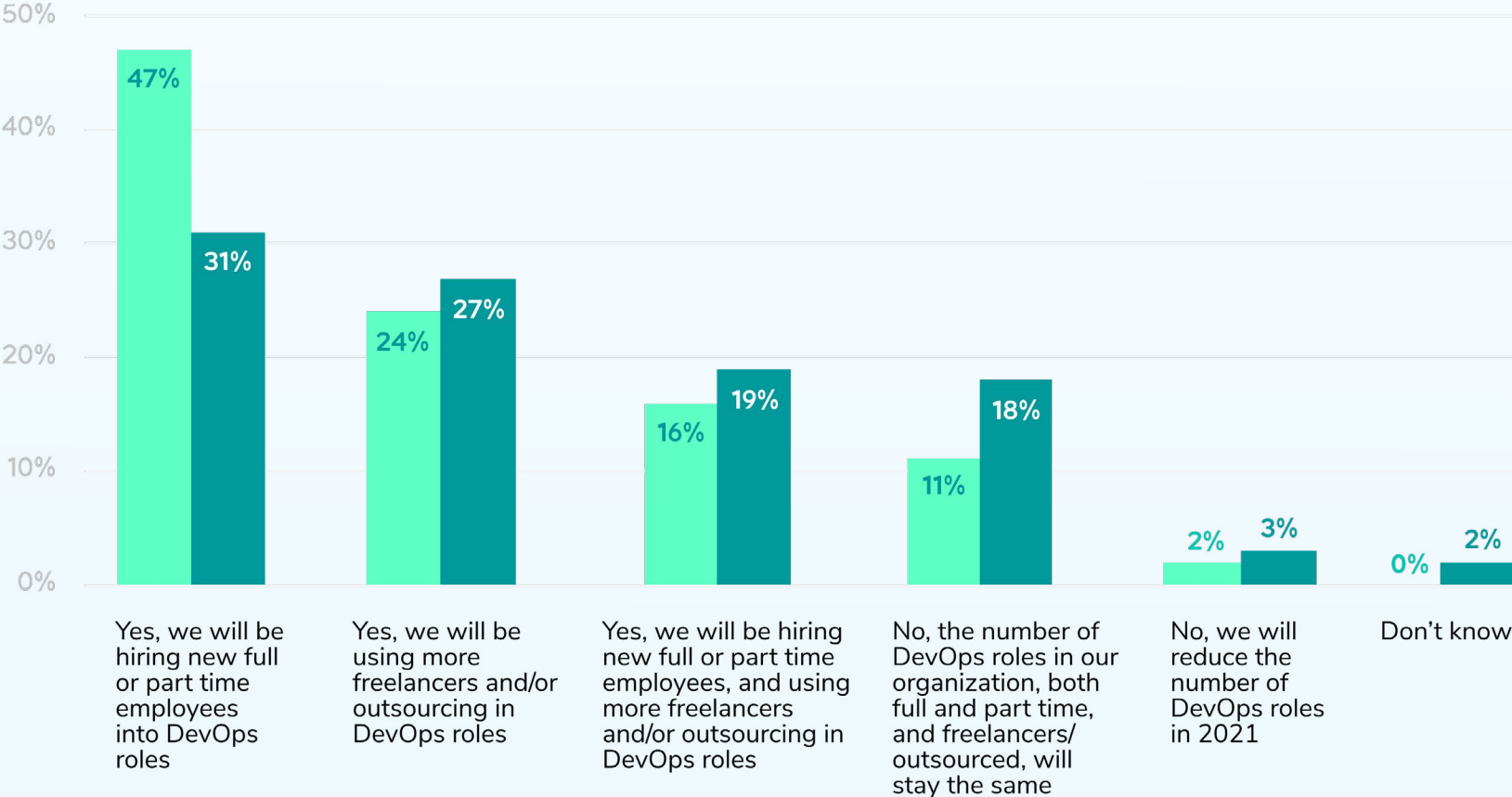
And so it comes as no surprise a majority of respondent organizations plan to budget more toward DevOps and tooling and increase headcount in 2021 compared to 2020.

Organizations that are using Kubernetes are substantially more likely to be increasing budgets (79% vs. 69%) and growing their teams (86% vs. 77%).

HAS OR WILL YOUR ORGANIZATION'S BUDGET FOR DEVOPS AND TOOLING CHANGE IN 2021, COMPARED TO 2020?

Our budget has increased or will increase	79% / 69%
Our budget has decreased or will decrease	7% / 12%
Our budget has not / will not change	13% / 15%
I don't know	1% / 4%

IS YOUR ORGANIZATION PLANNING TO HIRE MORE STAFF OR INCREASE THE USE OF FREELANCERS/OUTSOURCING INTO IN DEVOPS ROLES IN 2021?

Yes, we will be hiring new full or part time employees into DevOps roles	47% / 31%
Yes, we will be using more freelancers and/or outsourcing in DevOps roles	24% / 27%
Yes, we will be hiring new full or part time employees, and using more freelancers and/or outsourcing in DevOps roles	16% / 19%
No, the number of DevOps roles in our organization, both full and part time, and freelancers/outsourced, will stay the same	11% / 18%
No, we will reduce the number of DevOps roles in 2021	2% / 3%
Don't know	0% / 2%

Closing remarks and next steps

We hope you found these survey findings as eye opening as we did.

More than anything, we're excited by the opportunity ahead of us: to move a little bit closer toward a world of zero-waste software development, where every developer can spend their time working on the problems they know will have the biggest impact on the business.

If you'd like to learn more about how Garden can help your organization create a faster and more efficient Kubernetes development process, we'd be happy to schedule time to speak with you.

Simply fill out this form, and someone on our team will follow up with you shortly.

You can also...

- Read more about our product
- Check out the documentation
- Ask a question in our community forum

Thanks, and we hope for a chance to speak with you soon.