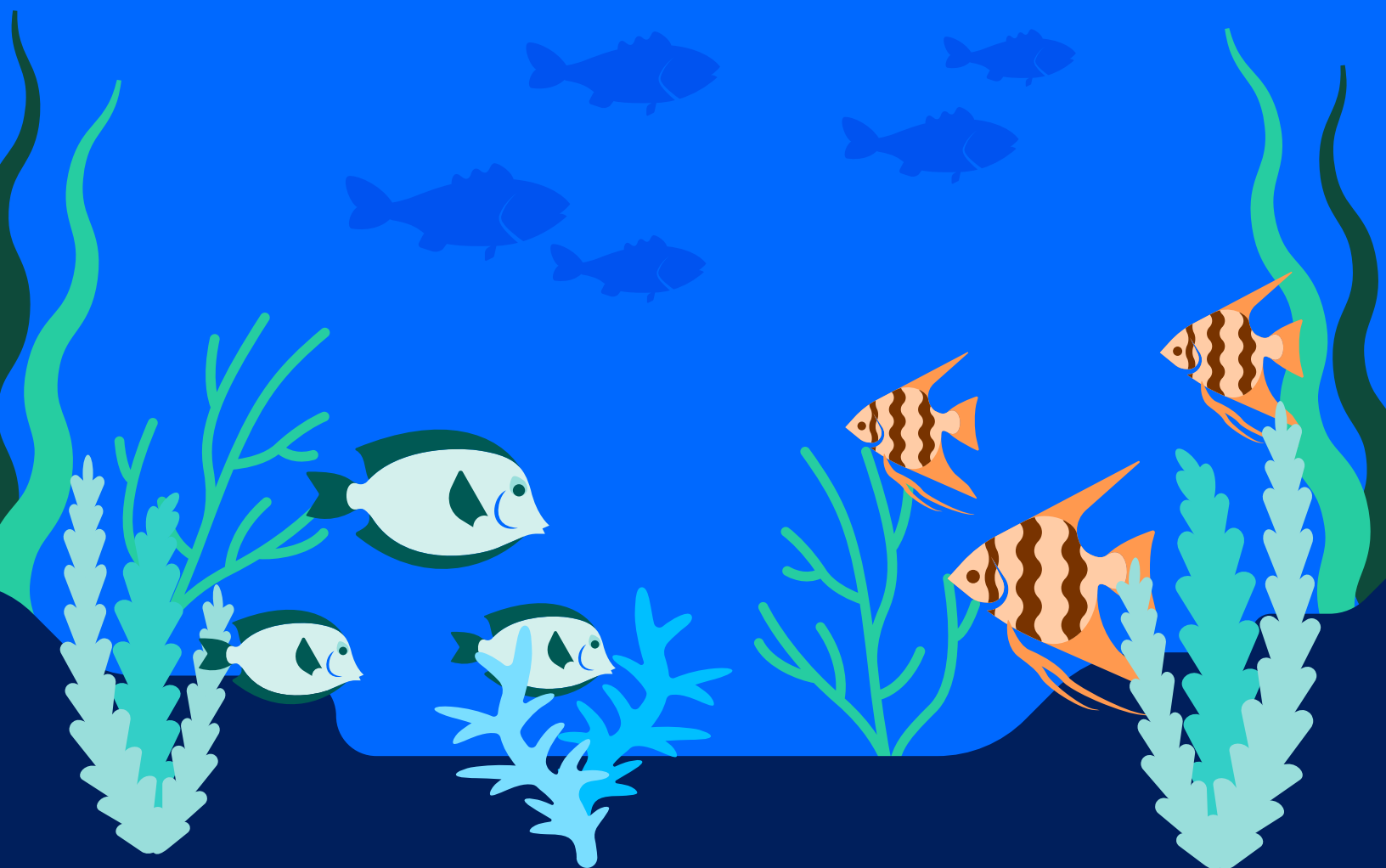




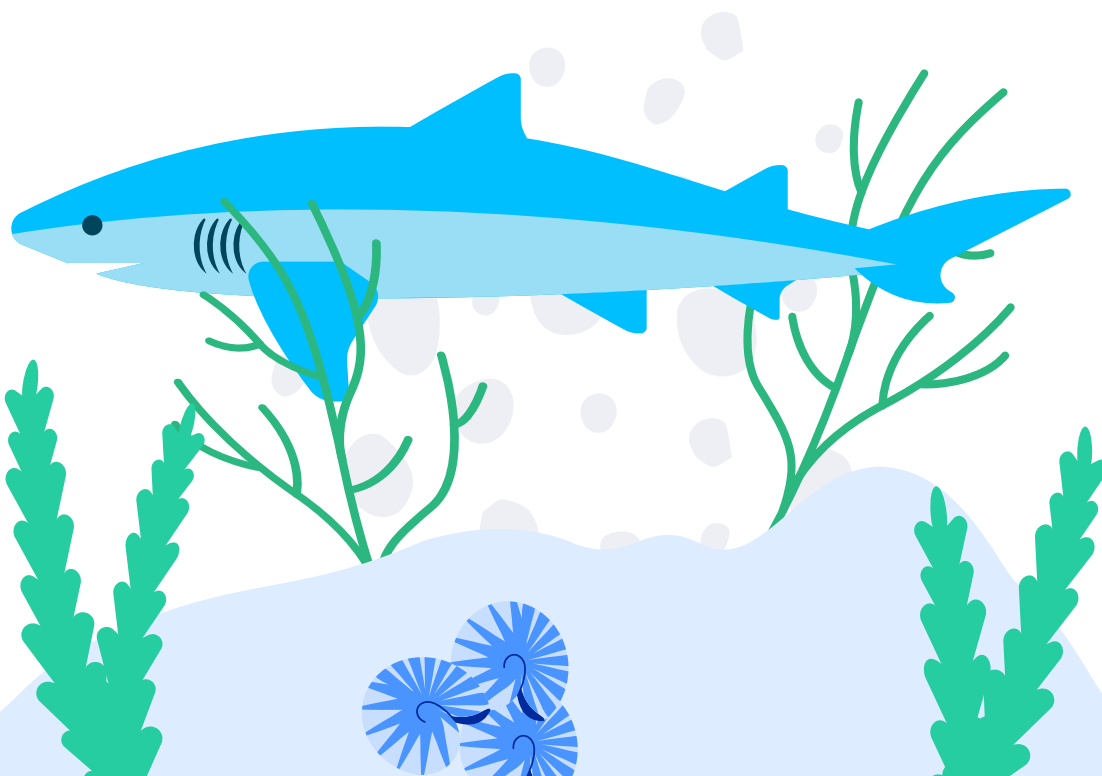
# CURRENTS

The 2022 report on open source  
and developer trends



# Table of contents

<b>Introduction</b> .....	<b>3</b>
<b>Open source findings</b> .....	<b>5</b>
Participation and usage .....	5
Open source community .....	7
Security and open source .....	7
Diversity and inclusion in open source .....	8
<b>Developer job trends</b> .....	<b>9</b>
Motivations to leave jobs .....	9
Top developer challenges .....	10
<b>Emerging trends</b> .....	<b>11</b>
Most popular programming languages .....	11
Usage of containers .....	12
Usage of serverless .....	12
Other trends — Low-code/no code, AI, blockchain .....	13



## **Currents is DigitalOcean’s regular report on how developers, startups, and small-to-medium-sized businesses (SMBs) are engaging with technology today.**

In this edition of Currents, we surveyed over 2,500 developers around the globe on their participation in the open source community, their job satisfaction, and the biggest challenges they face. We dug into emerging trends, including serverless and low-code solutions, and examined the popularity of containerization systems and different coding languages. We looked into how factors such as years of job experience and company stage factor into technology usage, and examined how minority groups, perceptions differ around progress in Diversity and Inclusion.

The results demonstrate some clear trends across all developers, and some findings that differ based on company size and years of experience. Throughout our survey, one trend that comes through across respondents is the impact that the Great Resignation has had on developers. Following the Great Resignation of 2020–2021, we are now seeing a developer talent shortage, motivated largely by compensation and a desire for remote work. There is also a small but clear movement for developers to leave jobs to start their own companies, indicating that entrepreneurship is strong among this group. Those who remain at their jobs are also stretched thin, with technical debt and lack of resources as top challenges for developers today.

Other main findings show that organizations continue to rely on open source projects for their software development, and participation in the community remains strong. Low-code and no-code solutions, which enable developers and non-developers to create applications without advanced coding skills, have garnered mixed feelings as they become more common, but Kubernetes and serverless solutions are both growing in adoption.

## Here are some of the key findings:

### The Great Resignation continues in the developer community

Over a quarter of developers who have been in the workforce for over a year started a new job in the past year, with developers at enterprises and startups changing jobs in roughly equal numbers. Additionally, 42% of those who haven't left their jobs yet are considering or may consider leaving their current jobs this year. Both those who have already left and those considering leaving jobs are motivated by two main factors: Compensation and fully remote or flexible work environments. With an ongoing rise in inflation and the continuing COVID-19 pandemic, it's clear companies need to offer high pay and work flexibility to retain developers.

### Open source remains at the heart of the developer community

About half of developers reported participating in open source in the past year, slightly more than our 2021 findings. Open source software remains vital to businesses of all sizes, though smaller businesses rely on it slightly more heavily, with 35% of startups and SMBs using open source in 50% or more of their software, compared to 28% of enterprises. Despite heavy reliance on open source technologies, most developers think that companies should give more time during work hours to contribute to open source. While 78% have not been paid for their contributions to open source, a majority believe that open source contributions should be paid. When it comes to diversity and inclusion in the open source community, there has been some improvements in the past years, with 65% saying it is inclusive. However, those in minority groups are more likely to think open source is not inclusive.

### Developer attitudes on cloud trends can be mixed

New cloud trends can draw mixed opinions. It's clear that containers are here to stay, with 68% reporting using containers for some projects, and the usage of serverless computing is picking up, with 44% using serverless already and 61% of that group expecting their usage to increase this year. However, opinions on low-code and no-code solutions are mixed, with developers with less years of experience being more likely to see the use of low-code, and those with more experience rating them as overhyped. Despite the rise of talk around blockchain and Web3 technologies, 67% say they don't use blockchain or Web3 yet, showing they have more room to grow their adoption.

**Read on for the full results** ↓



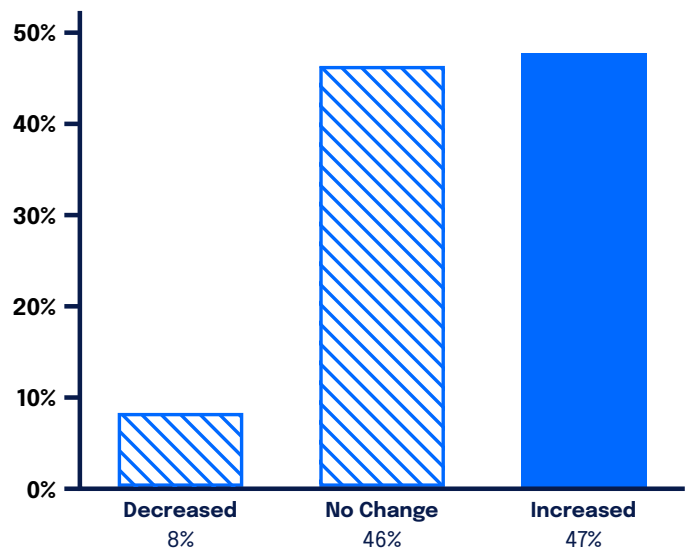
# Open source

## Participation and usage

We found that 50% of respondents participated in open source in the past year, roughly in line with our 2021 findings, which found 47% had participated in open source in the past year, and below the 63% who reported participating in open source before the COVID-19 pandemic began. Of those who participated in open source, 47% stated their participation has increased, with 46% reporting no change and only 8% reporting that their participation has decreased since the pandemic started.

Participation is roughly equal for those working at startups/SMBs and enterprises, but those with a year or less experience are most likely to have participated in open source in the past year, at 55%. Overall, a majority (54%) say they are open source project contributors, with 14% stating they are maintainers and 32% both maintaining and contributing to projects.

## How has your level of participation in open source changed since the pandemic started?



Open source technology is vital to the companies of today, with 64% of respondents stating that their company uses open source code for 50% or more of their software. We find that startups and small businesses rely on open source slightly more than enterprises, with 35% of startups/SMBs using open source code in 50% or more of their software, compared to 28% of enterprises.

Infrastructure modernization, application development, and SaaS development are some of the most popular uses of open source software, and developers predict they will use more open source for blockchain development this year (7%) than reported using open source for blockchain in the past year (4%).

Despite the industry's heavy reliance on open source projects and those who maintain them, most contributors and maintainers have not been paid for their work, and many developers believe that companies should be providing employees more time to contribute upstream to open source projects.



## Factors surrounding open source participation

Payment for open source is a debated topic—while just 20% have been paid for their contributions to open source, 53% agree or strongly agree that individuals should be paid for open source contributions.

Time is a large factor in participation in open source. Most developers (54%) spend 1–5 hours per week on open source contributions, and time is listed as the biggest barrier to contributing to open source projects. Many believe that companies should give more time to employees to contribute to open source, with 79% agreeing or strongly agreeing that companies should give time during work hours to contribute.



**79% agree or strongly agree that companies should give time during work hours to contribute.**

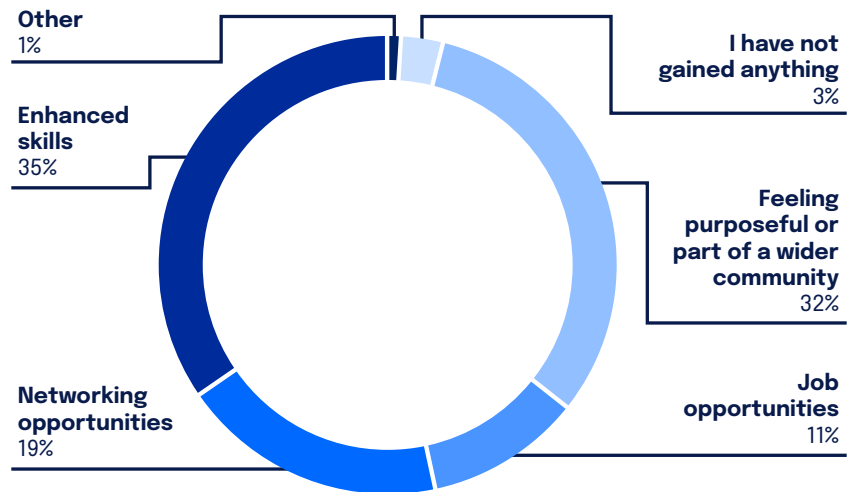
Other factors inhibiting participation in open source include not knowing where to start (11%), not having guidance from other contributors (11%), and finding the approval process confusing (7%).



## Open source community

It's clear that community is at the core of open source, with 20% mentioning they have helped other community members develop their skills, and 15% contributing to mission-focused or diversity and inclusion-related projects. When asked what they had gained from contributing to open source, 32% said "feeling purposeful or part of a wider community." Open source may be one factor encouraging developers to seek out new roles, as 35% have gained enhanced skills, 19% networking opportunities, and 11% have found job opportunities through the open source community.

## What have you gained from contributing to open source?



## Security and open source

Security is often a concern around open source code, and 43% believe that employing dedicated security experts to oversee projects would improve the security of open source. In line with the above findings around payment for open source, 37% believe increased compensation and training for contributors would improve security.

Just 14% of respondents believe that increased regulatory oversight would improve open source security, and 33% say that increased oversight would prevent them from contributing, with an additional 38% stating that they're "not sure" if it would decrease their contributions.



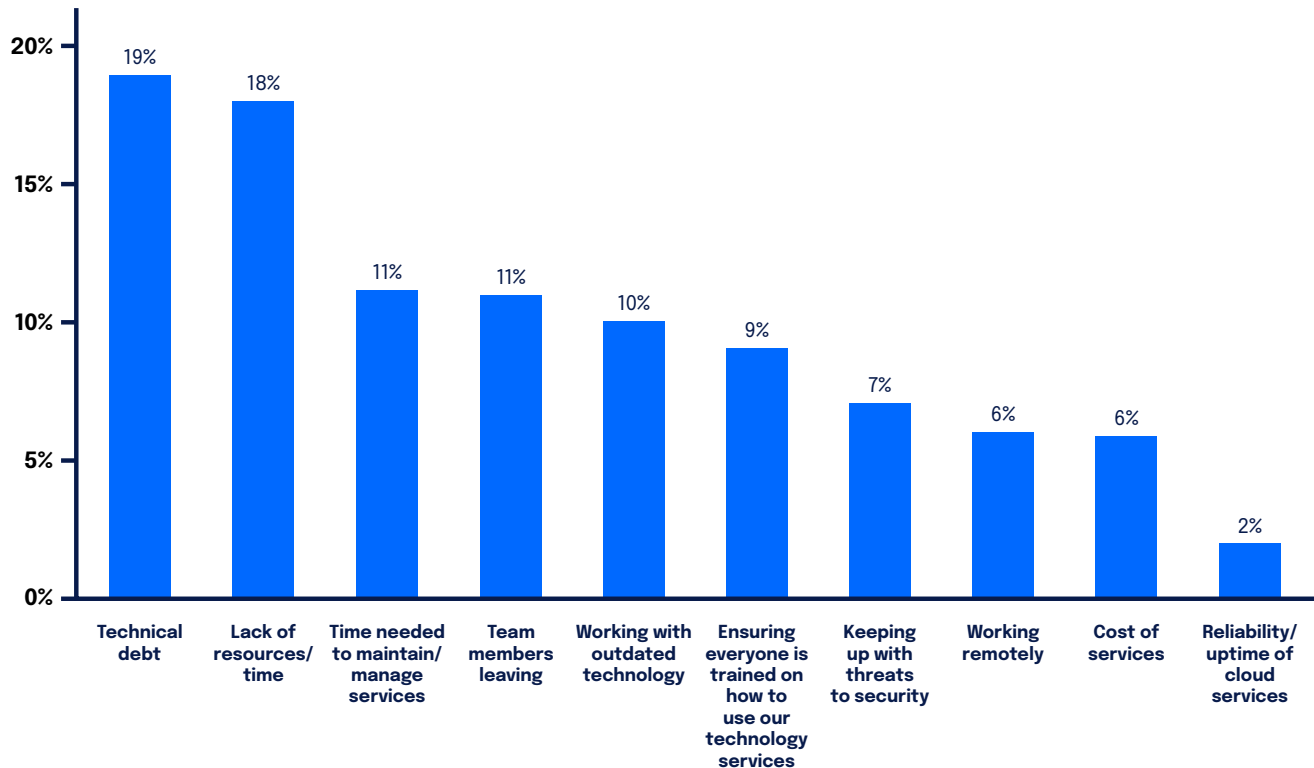






## Top developer challenges

Looking at challenges facing developers today, we find that technical debt and prioritizing speed of delivery over quality code are the top challenges for developers. Lack of time and resources to work on projects is also a key challenge, cited by 18% of respondents, and 11% mention team members leaving as a challenge, demonstrating that the developer talent shortage is impacting even those who stay in their roles.

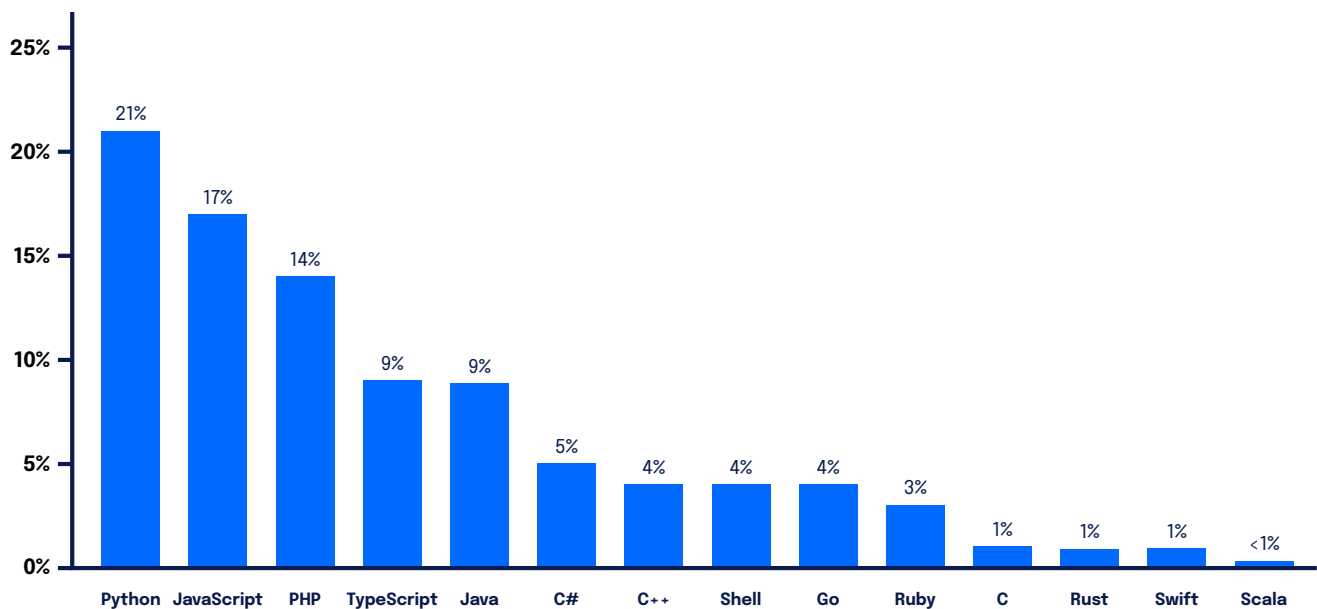


# Emerging trends

We also examined popular programming languages and developers' perceptions of upcoming trends, finding that perceptions of many trends differ based on years experience, with less experienced developers more likely to try out new trends in computing such as automation, blockchain/Web3, and low-code or no-code.

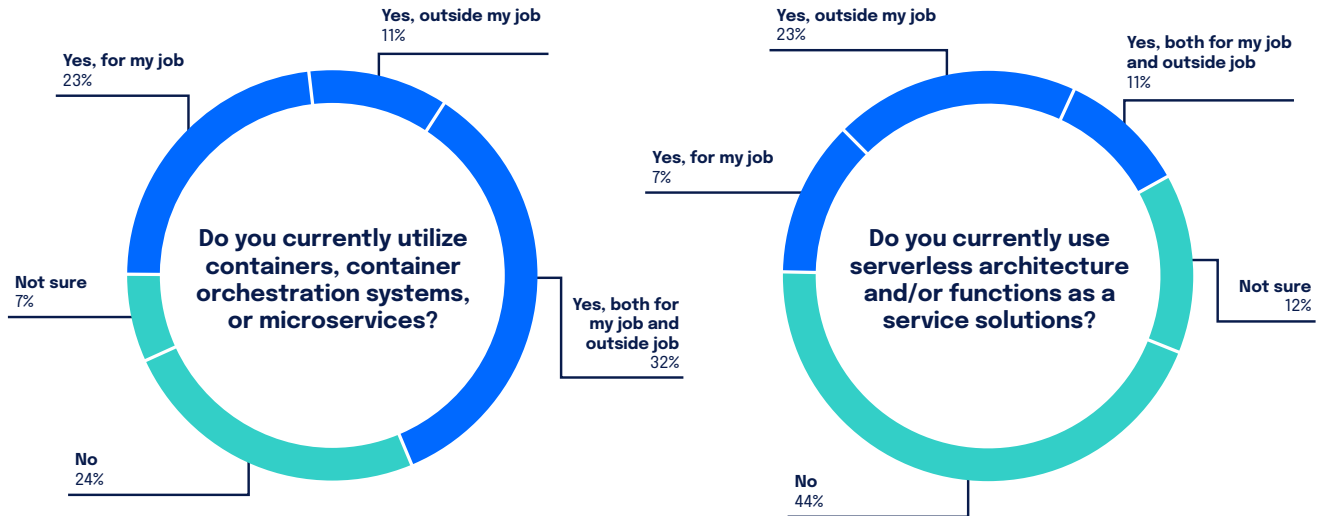
## Most popular programming languages

Looking at popular programming languages, we found that Python (21%) and JavaScript (17%) are the most popular languages, followed by PHP (14%), TypeScript (9%), and Java (9%). While Python is popular with developers of all experience levels, JavaScript and C++ are more popular with less experienced developers. PHP is less popular with newer developers, but remains popular among those with more than 6 years of experience.



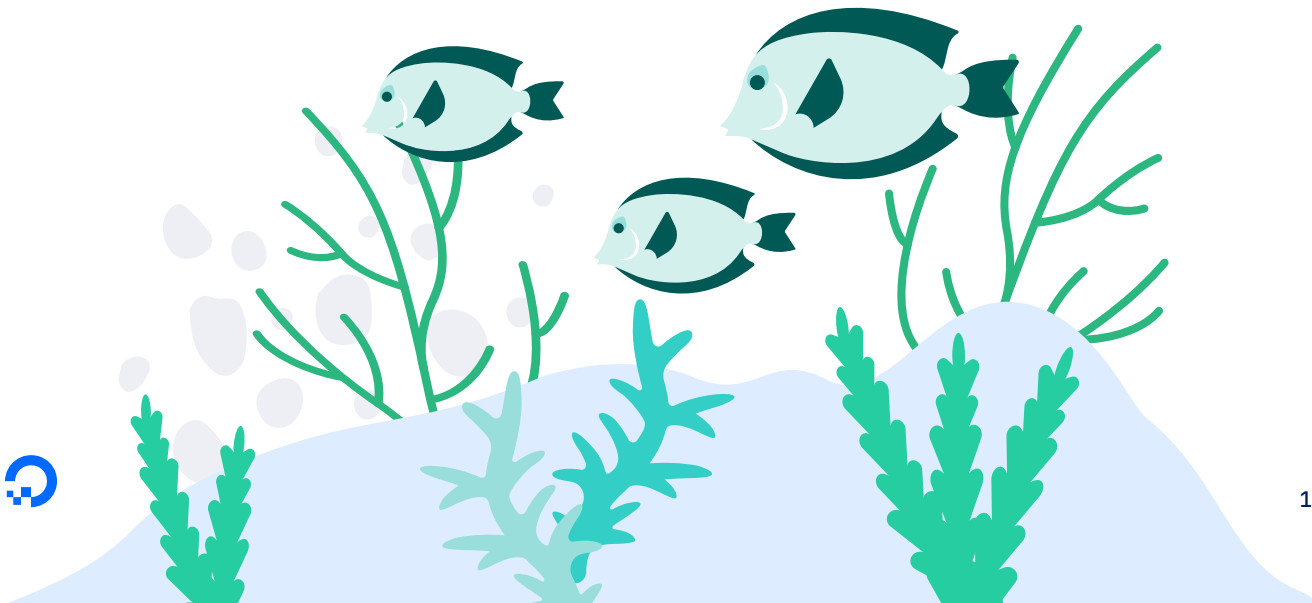
## Usage of containers

Containers and container orchestration systems continue their rise in usage, with 68% of respondents using containers for some projects, and 69% of those using containers expecting their usage to increase in the next year. Additionally, 47% say their usage of Kubernetes specifically will increase this year. Of those not already using containers, 22% believe they will start using container technology this year.



## Usage of serverless

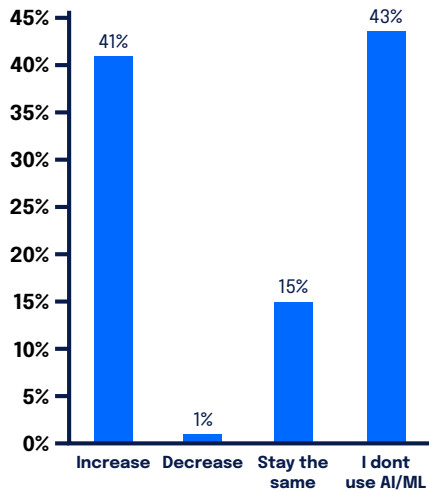
Serverless computing, a newer technology that minimizes server management and enables users to focus only on code, is also rising in popularity, though is less widespread than containers. We find that 43% of respondents are using serverless technology, and of those using it 61% expect their usage to continue to increase. However, those not using serverless are less sure if they will adopt it, with only 9% predicting they will start using serverless this year and 39% stating they are not sure if they will adopt serverless.



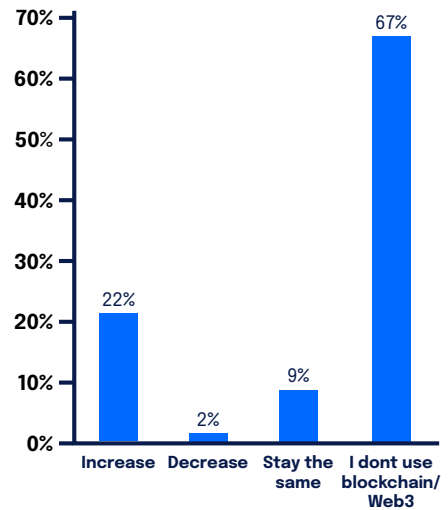
## Other trends

Developers have mixed opinions and usage of other emerging technologies, including automation (AI/ML), blockchain and Web3, and no-code or low-code tools. In regards to using automation tools, 57% of respondents have used them and 41% believe their usage of automation will increase this year, while 43% don't use automation at all. Although blockchain and Web3 have been discussed widely, 67% say they don't use blockchain or Web3 technology.

**How do you expect your use of automation (AI/ML) to change this year, compared to last year?**



**How do you expect your use of blockchain and/or Web 3 to change this year, compared to last year?**



Low-code and no-code tools have gained popularity among developers looking to focus more on application innovation and less on specific software code, however we found opinions of these tools varied widely. In total, 21% stated that low-code/no-code tools are over-hyped, but 12% mention that they make their jobs easier. These opinions differed clearly by years of experience, with developers with fewer years of experience being much more likely to find low-code and no-code tools helpful, and those with more than 15 years of experience the most likely to think they are overhyped.

## Years of experience

	Less than 1 year	1-5 years	6-10 years	11-15 years	Over 15 years	
Positive	They make my job easier	30.2%	21.2%	20.0%	15.3%	12.5%
	They allow me to focus on more important tasks	22.5%	20.8%	18.1%	15.3%	11.5%
	I do not see them as a threat	16.2%	28.4%	28.4%	27.0%	25.8%
Neutral	I am not familiar	20.3%	20.6%	20.2%	17.2%	18.8%
	They make no difference in my day-to-day work	15.2%	24.6%	22.2%	28.1%	26.5%
	We need to put more guard rails in place before I'll fully trust them	7.0%	8.6%	8.0%	8.0%	10.4%
Negative	They are over-hyped	25.4%	33.3%	39.3%	37.2%	40.4%
	I see them as a threat to my job	3.2%	3.3%	3.7%	1.5%	2.3%
	They cause confusion within my organization	7.6%	6.9%	9.9%	6.6%	9.3%
	They make my job more difficult	3.2%	5.8%	10.5%	5.8%	7.0%



## India-specific findings

Findings specific to respondents from India were largely in line with those from the overall survey, however we have highlighted some key statistics from India below:

- 56% of respondents from India have participated in open source in the past year, and 71% of those respondents say their participation has increased during the pandemic.
- Just 12% of respondents say they have been paid for their contribution to open source, compared to 20% of all respondents.
- 67% agree or strongly agree that individuals should be paid for their open source contributions, and 79% believe companies should give more time for open source contributions.
- 22% in India have contributed to mission-focused or Diversity and Inclusion open source projects, compared to 15% of the total sample.
- Open source has contributed to learning and networking in India, with 37% stating they have gained enhanced skills from open source, 23% networking opportunities, and 10% have found job opportunities through the open source community.
- The Great Resignation and developer talent shortage trends are strong in India, with 32% of those who have been working for more than a year reporting they have started a new job in the past year, and 44% of the same group considering leaving or may consider leaving their job this year.
- Feelings in India are more favorable towards low-code and no-code tools: 23% say they make their job easier, and 18% say they allow them to focus on more important tasks. Just 15% say these tools are overhyped, compared to 21% in the total sample.
- Usage of containers and serverless architecture is slightly lower in India than overall, with 55% saying they use containers, container orchestration systems, and microservices, compared to 68% of all respondents. Those using serverless architecture is 32%, compared to 44% in total.
- A slightly higher percent in India are using or plan to use blockchain technologies and automation (AI/ML); 55% of those in India compared to 33% in the total sample are already using blockchain technology. Additionally, 13% of India respondents believe they will use open source for blockchain technologies next year, compared to 7% of total respondents, while 68% are using automation compared to 57% in the total sample.

## Methodology

This survey was conducted through an online survey link from April 19, 2022, to May 19, 2022, and garnered 2,598 completed responses. The link was distributed to various sample sources, including DigitalOcean email lists and open source groups. Respondents all identified as having technical roles, including frontend, backend, and full-stack developers, system administrators, DevOps specialists, and more. Those without technical roles were screened out of the survey.

Respondents represent 94 countries, with 43% coming from the United States, 15% from India, 6% from Germany, 3% from Canada, and 3% from the UK, and the remaining 30% spread between other countries. The gender breakdown was 87% male, 8% female, 1% non-binary, and 4% who preferred not to say or preferred to self-describe. Respondents represent a range of ages, with 32% of respondents being 25–34, 25% ages 35–44, 21% under 24, and 22% 45 or older.





# About DigitalOcean

**DigitalOcean simplifies cloud computing so developers and businesses can spend more time building software that changes the world.** With its mission-critical infrastructure and fully managed offerings, DigitalOcean helps developers, startups, and small- and medium-sized businesses (SMBs) rapidly build, deploy, and scale applications to accelerate innovation and increase productivity and agility. DigitalOcean combines the power of simplicity, community, open source, and customer support so customers can spend less time managing their infrastructure and more time building innovative applications that drive business growth.

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