



The 10th Annual **Open Source Jobs Report**

Critical Skills, Hiring
Trends, and Education

June 2022

With a Foreword by Clyde Seepersad, SVP & General Manager,
Linux Foundation Training & Certification

In partnership with



Contents

Foreword	3	The Value of Architecting, Deploying, and Developing Open Source Software in 2022	29
About the Research	5	The Hiring Manager Point of View	30
The Hiring Landscape in 2022	6	The Open Source Professional Point of View	33
The Open Source Talent Pool in 2022	9	The Linux Foundation Perspective	35
The Importance of Cloud Technology Skills	11	Diversity, Equity, and Inclusion in 2022	36
The Importance of Linux Skills	12	Progress is Visible	37
The Importance of DevOps Skills	13	More Progress on DEI Initiatives is Needed	38
The Importance of Cybersecurity Skills	13	About the 2021 The Linux Foundation DEI Study	40
Talent Acquisition and Retention in 2022	15	Conclusions	41
The Hiring Manager Point of View	17	Methodology	42
The Open Source Professional Point of View	18	How Missing Data is Handled	42
Changes to Culture	19	Survey Demographics	43
The Linux Foundation Perspective	21	Appendix	46
The Educational Advantage	22	Acknowledgments	56
Why an Open Source Career?	23	Disclaimer	56
Training and Certification in 2022	24		
The Hiring Manager Point of View	25		
The Open Source Professional Point of View	26		
The Linux Foundation Perspective	28		

Foreword

This is the tenth iteration of the Linux Foundation's Open Source Jobs Report for organizations, hiring managers, and, of course, open source professionals. While there are many immediate and important trends hiring managers need to know, looking back to our first report, the most striking trend is the long-term growth trajectory of open source. This growth will only accelerate — projected by some to be at least [18.2% through 2026](#) — meaning organizations and their hiring managers will see a commensurate increase in the challenges of open source talent recruitment and retention.

Architecting, deploying, and developing open source software is the key to everyone's success in 2022.

It may not be a post-pandemic world yet, but this year's survey results show that open source professionals, and the organizations they work for, are learning to live with — and work around — COVID. Global business growth and a reluctance to continue to delay new projects are powering a highly competitive market for open source talent that can architect, deploy, and develop open source solutions.

The explosive increase in the use of open source, the drive for digital transformation of outdated systems, and the need for increased security are only adding to the pressures. It's clear that there is pent-up demand for more; more open source solutions and more open source professionals. Taken together, these factors present serious challenges for hiring and retaining well-trained, experienced open source talent.

The talent challenge is most acute for open source professionals that bring a smart combination of deep technical knowledge and the breadth of skills required to connect people and solutions across team and technical silos. Professionals who know cloud/container

technologies, Linux, DevOps/GitOps/DevSecOps, and cybersecurity are most in need. Demand for professionals with skills sets around artificial intelligence/machine learning is also rising, while demand for web technology focused skill sets are in decline.

How can hiring managers — 93% of whom report having difficulty hiring open source talent — attract and retain people that have the right experience to meet their organizations' needs?

First on the list is money. The "great re-evaluation" has put money front and center in the quest for talent acquisition and retention. While this is potentially a short-lived issue, it is not to be ignored. Professionals are jumping jobs for significant salary increases and organizations are giving open source talent higher salary increases than other business areas to stave off resignations.

After financial considerations, the most common reason open source professionals cite for changing jobs is the opportunity to work on professionally challenging projects at organizations that support their drive to grow. They want organizations that offer interesting projects and support professional learning. This includes being able to participate in the open source community, which is essential for highly-talented pros. And all of this needs to be provided with an eye toward flexibility of where and when they work in order to increase their sense of work/life balance.

Faced with the reality that there are more openings than qualified people, employers are well-positioned to leverage professionals' desire to learn and grow as a means to achieve the staffing goals that will enable the organization to succeed. In part because professionals and organizations align around several key approaches.

For example, contributing to the open source community is key to talent retention and is recognized by organizations as a strong



PHOTO BY PAUL HANAOKA ON UNSPLASH

indicator of skilled talent as well as a morale enhancer. In the same vein, professionals want to pursue training and certifications. Supporting this interest will both help to close an organization's talent gap and provide additional retention incentive.

Diversity, equity, and inclusion initiatives represent a potential pipeline of untapped talent. While almost all organizations say they encourage diversity in hiring, the percentage of organizations recruiting underrepresented individuals has declined from the 2021 survey. Organizations willing to invest in pursuing and providing extra support to encourage success for underrepresented groups could end up being the biggest winners of all in the talent acquisition game.

Two final thoughts. First, circumstances around the world — from war to inflation to pandemic spread — remain volatile, uncertain and complex. Organizations need to remain on guard for the unexpected. Second, organizations will struggle to simply hire their way out of the talent shortage. A paradigm shift is required, one that focuses long term on growing and retaining talent rather than managing churn.

On behalf of the Linux Foundation, I would like to thank our partner edX and all who contributed to this research, especially the hiring managers and open source professionals who, year after year, make time to complete the survey. We hope you will continue to participate in our research, and will leverage this insightful report designed to aid training-related strategy and decision making across the open source community.

Clyde Seepersad
SVP & General Manager
Linux Foundation Training & Certification

About the Research

The following report presents findings on the employment experiences and needs of open source professionals (OSPs) as well as the hiring managers charged with recruiting and retaining them. The findings are based on responses to a survey developed in February 2022 and fielded as a web survey in March 2022. Respondents self-identified as an open source professional (someone who uses or contributes to open source technologies) or someone who recruits or hires OSPs. It is the Linux Foundation's 10th annual report and is co-presented with EdX.

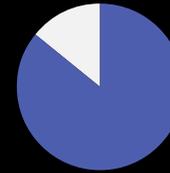
The survey included five sections:

1. Screening questions
2. Demographics
3. Questions for OSPs
4. Questions for hiring managers of OSPs
5. Finals questions on how to improve the survey and diversity

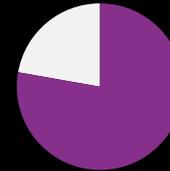
To facilitate a clear narrative, data points presented in the text reference either a figure embedded in the text or a figure in the Appendix. For more information about this research approach and sample demographics, see the Methodology section beginning on page 42.

PART 1

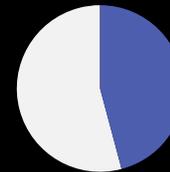
The Hiring Landscape in 2022



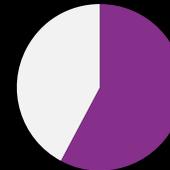
86% of hiring managers say hiring open source talent is a priority for 2022.



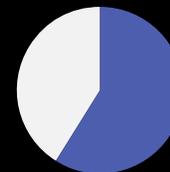
78% of hiring managers are hiring the same or more open source professionals compared to 2021.



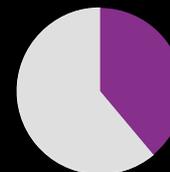
46% of hiring managers plan to increase open source professional hiring in the next 6 months.



58% of companies report open source talent is given higher salary increases than other business areas.



59% of hiring managers report organic growth is driving demand for open source talent.



39% of hiring managers reported they have increased the use of open source, causing talent shortages.



“The explosive increase in the use of open source solutions, the drive for digital transformation of outdated systems and the need for increased security are only adding to the pressures. **It’s clear that there is pent-up demand for more; more open source solutions and more open source professionals.**”

— CLYDE SEEPERSAD, SVP & GENERAL MANAGER,
LINUX FOUNDATION TRAINING AND CERTIFICATION

The Hiring Landscape in 2022

It may not be a post-pandemic world yet, but this year’s survey results show that open source professionals (OSP), and the organizations they work for, are learning to live with — and work around — COVID. The pandemic has changed how we attract, hire, organize, and retain OSP talent. Perhaps the biggest change caused by the pandemic is the increase of remote work options. This has affected human resource policies and decision-making and created tensions around many employers’ desire to see employees return to the office.

OSPs continue to be in demand because 98% of organizations use open source software (Software Bill of Materials and Cybersecurity Readiness Report, January 2022). When hiring managers were asked if hiring open source professionals was a priority, 86% said yes; 14% said no (FIGURE A1).

When explicitly asked about their organization’s plans to hire open source professionals over the next six months of 2022, FIGURE 1 shows that 46% of hiring managers stated they are planning to hire more open source professionals compared to the prior six months; 32% said they would be hiring about the same amount; 8% said they would be hiring less; 14% said they would not be hiring OSPs.

FIGURE 1

HIRING PLANS 2022 Q2-Q3

In the next six months, what are your organization's plans as they relate to hiring professionals with open source-related skills as compared to the last six months? (Select one)



Q65, OSP HIRING MANAGERS, SAMPLE SIZE = 559



KEY TAKEAWAY

Open source skills are in increasingly higher demand.

If we aggregate the data in FIGURE 1, we see that 78% of hiring managers are hiring the same or more open source professionals and 22% are hiring fewer or no open source professionals.

As with the previous year, demand for open source talent is driven primarily by organic growth within organizations, as reported by 59% of hiring managers (FIGURE A2). The second most common response was that organizations had increased their use of open source, leading to talent shortages, as reported by 39% of hiring managers (FIGURE A2). These are consistent with the wider economic rebound, as organizations again experience growth and continue to invest in digital transformation activities, further driving open source adoption.

This year's survey data indicates that open source is the place to be, emphasizing the importance of having skills in the technology development sector over almost any other. The data also indicate that professionals holding valid credentials are more likely to be familiar with the latest technological advances, thus helping ensure organizations have the needed skill sets to manage change efficiently and effectively. ■

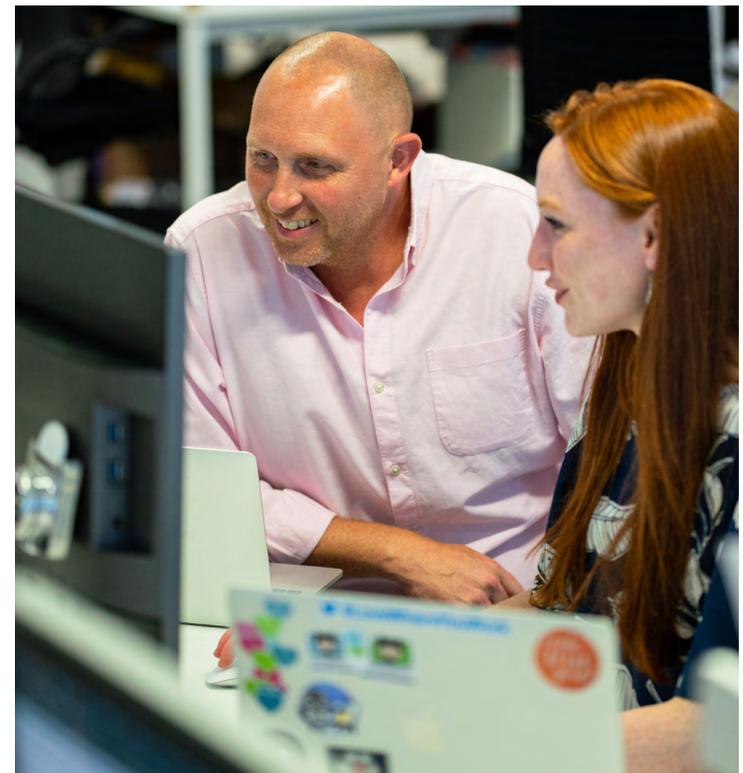
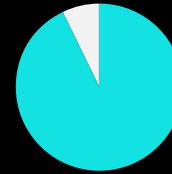


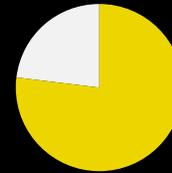
PHOTO BY THISISENGINEERING ON UNSPLASH

PART 2

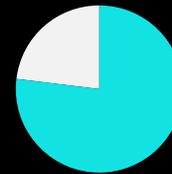
The Open Source Talent Pool in 2022



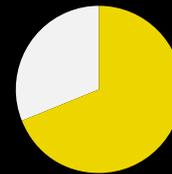
93% of hiring managers report difficulty finding professionals with the needed open source experience.



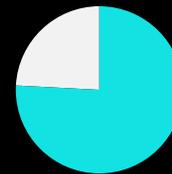
77% of organizations are growing their use of cloud/container technologies.



77% of professionals believe more cybersecurity training would be useful.



69% of hiring managers report that cloud technologies are demanded the most.



76% of professionals work on open source projects related to Linux.

The Open Source Talent Pool in 2022

40% of OSP hiring managers found it very difficult to find professionals with open source skills; 53% reported that it was somewhat difficult; and 7% found it was not difficult at all (FIGURE A3). That means a total of 93% of hiring managers find it challenging to recruit all the open source professionals they need.

FIGURE 2 shows the top 10 technologies in demand from the perspective of both OSPs and hiring managers. Significant differences exist between the demand for Linux and DevOps/GitOps/

DevSecOps experience as identified by hiring managers and the lesser importance attached by OSPs.

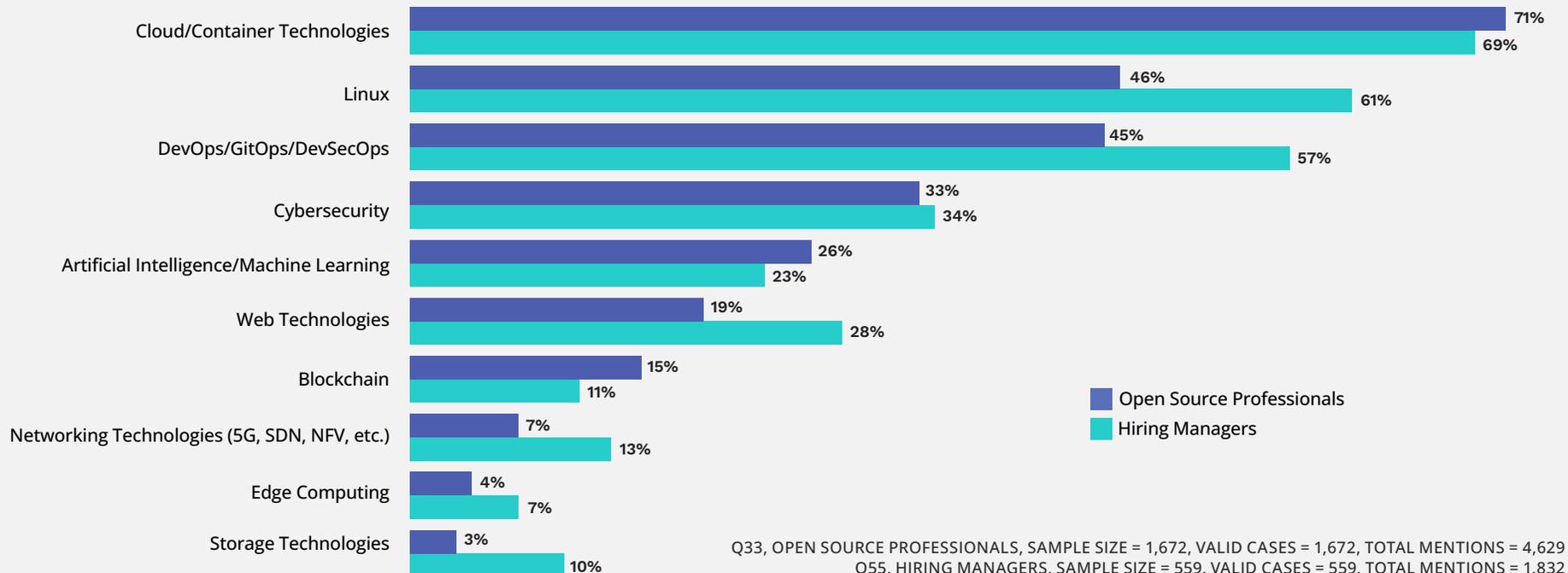
Open source cloud/container technologies demand is in a class by itself (due to Kubernetes). However, when combined with the strong demand for Linux and DevOps skills sought by hiring managers, it's clear that organizations biggest needs are in:

- Managing cloud operations
- Scalability
- Processes for application development and deployment

FIGURE 2

TECHNOLOGIES WHERE OPEN SOURCE SKILLS ARE IN DEMAND

In what areas of the job market do you believe open source skills are in the most demand? (Select up to three) *and*
What open source technologies are you seeking talent for? (Select all that apply)



Having teams of top talent has long been a differentiating factor in achieving competitive advantage. So what do hiring managers and OSPs think is the top priority for 2022? **FIGURE 2** shows that 71% of OSPs and 69% of hiring managers say that cloud and container skills are in high demand. The demand for these skill sets is consistent with the shift to the cloud with its capabilities to automate and orchestrate at scale.

Similarly, **FIGURE A4** shows that 73% of hiring managers report that knowledge about cloud and containers is the area most likely to have an impact on candidate selection. Knowledge about Linux is second at 66%, followed by DevOps at 49% and Cybersecurity at 40%.

In 2021, among hiring managers, cloud native technologies surpassed Linux for the first time in the history of this report. For 2022, these two top skill positions did not change. However, the importance of DevOps and DevSecOps skills increased in prominence, with cybersecurity coming in fourth. Web Technologies are now in a distant fifth place, especially according to OSPs.

“We are a large organization where managers don’t have much visibility into the newer technologies. We have to explain why a certification with training costs close to \$500 and how we can implement it in the current business ecosystem. Managers are not well-versed in containerization and how it helps us modernize apps.”

—SENIOR DEVOPS ENGINEER

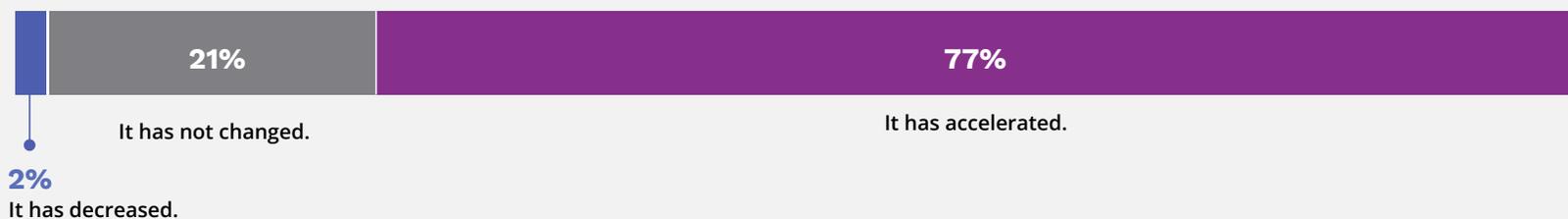
The Importance of Cloud Technology Skills

Cloud technologies continue to see significant growth. **FIGURE 3** shows that 77% of organizations are seeing growth in the use of cloud technologies compared to just 21% of organizations whose usage has not changed and 2% who reported decreased use.

FIGURE 3

HOW ORGANIZATION USE OF CLOUD TECHNOLOGY HAS CHANGED IN THE PAST YEAR

How has your organization’s use of cloud technology changed in the past year? (Select one)



Q37, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,672, VALID CASES = 1,481.
DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

The growth in demand for cloud native skills aligns with the experiences of the Linux Foundation Training & Certification program. From 2019 to 2021, the year-over-year growth across all Cloud Native Computing Foundation (CNCF) certifications has averaged 216% per year. Over 1,000 cloud certification exams are delivered each week, and over 152,000 registrations are processed across the Certified Kubernetes Administrator (CKA), Certified Kubernetes Application Developer (CKAD), Certified Kubernetes Security Specialist (CKS), and Kubernetes and Cloud Native Associate (KCNA) examinations total.

The Importance of Linux Skills

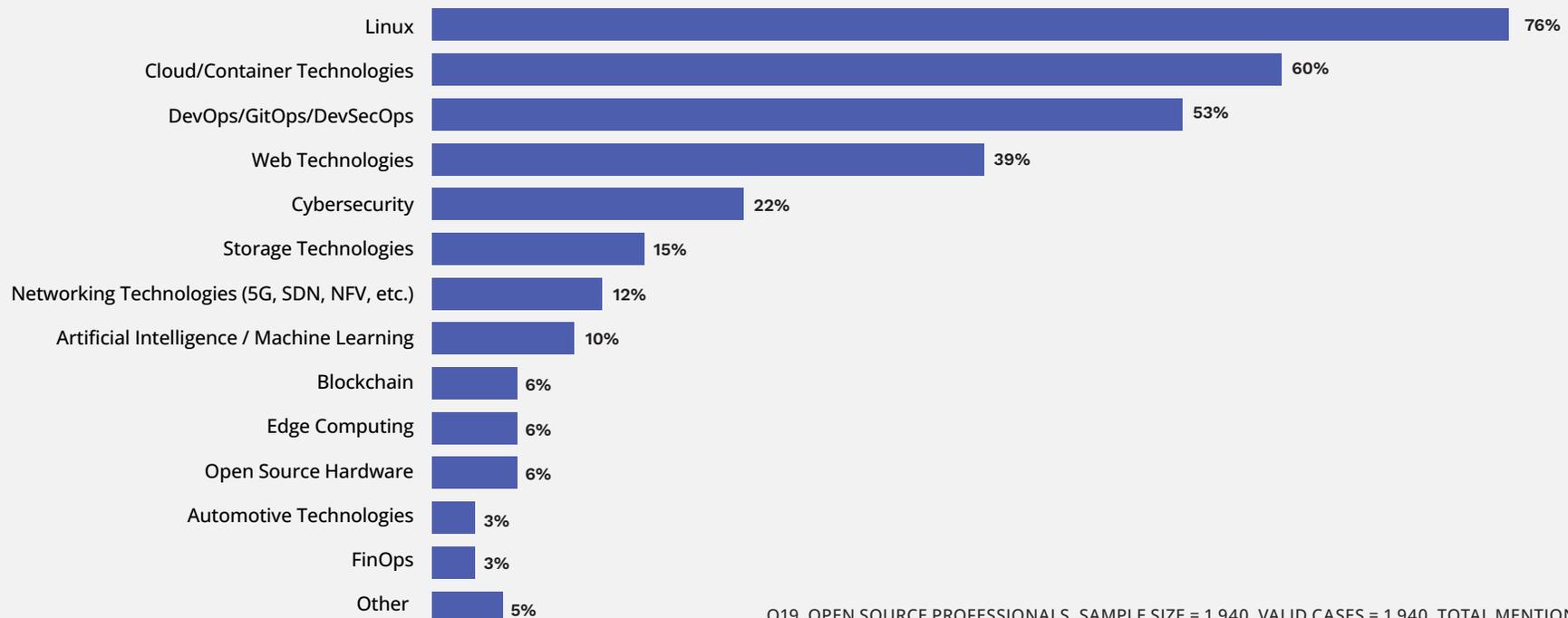
Linux continues to rank as the most important or second most important technology as shown in **FIGURE 4**. When open source professionals are asked what open source projects they contribute to; Linux ranks first at 76% and is followed by cloud/container technologies at 60%; DevOps/GitOps/DevSecOps at 53%; web technologies at 39%; and cybersecurity at 22%.

Linux is a mainstay operating system of all of the leading cloud service providers (CSPs). In fact, most CSPs structure their compute resources around one or more Linux distributions and Windows images.

FIGURE 4

OPEN SOURCE PROFESSIONAL PROJECT INVOLVEMENT

What open source initiatives/projects do you work with? (Select all that apply)



Q19, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,940, VALID CASES = 1,940, TOTAL MENTIONS = 6,096

The Importance of DevOps Skills

DevOps skills remain in high demand and open source professionals confirm this. FIGURE 5 shows that 79% of open source professionals view DevOps knowledge as either extremely important (35%) or very important (44%).

DevOps provides a framework that can provide a full lifecycle approach to application development, deployment, and operations

that integrates with domain-specific capabilities to address automation, scalability, and cybersecurity. This is why DevOps and its variants including GitOps and DevSecOps continue to be important even after 10 years.

The convergence of cloud computing and DevOps, with Linux as a foundational technology, means that to be successful in an organization's digital transformation, you need to have employees in the talent pool from all three areas.

“For technology professionals, a few things are critical to staying on top of the game:

- Endeavor to keep learning, even if it is slow and painful – and try to find time to learn something new every day. It keeps you motivated.
- Try to understand the overall or system architecture relevant to the technology, and how these are tied together for product development, maintenance, and product lifecycle.
- Enhance problem-solving and debugging skills.
- Be nice to others and show empathy. Nobody knows everything, and every one of us is struggling. We all have our strengths.
- And finally, communicate well to understand the problem and resolve conflict. Good communication is key to further progress.”

—OPEN SOURCE ENGINEER AT A CYBERSECURITY FIRM

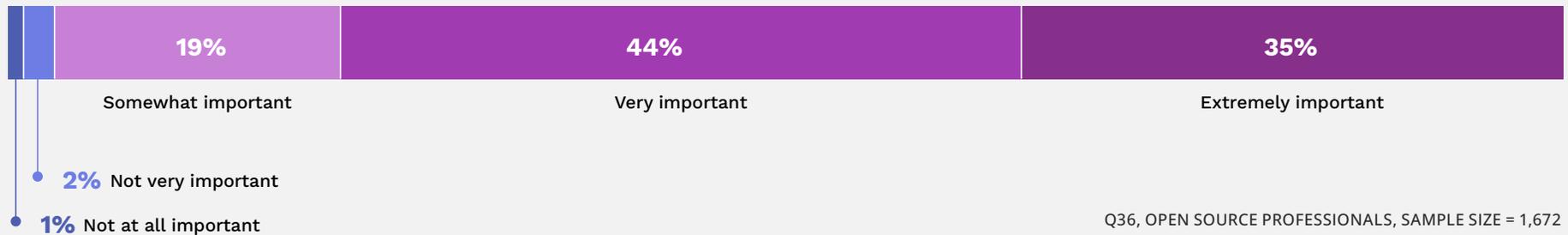
The Importance of Cybersecurity Skills

The rise of prominent cyberattacks and disclosures of security vulnerabilities in open source code also means proficiency in using DevSecOps and other cybersecurity toolsets and methodologies has become increasingly important. FIGURE 6 shows that 61% of organizations agree (strongly agree 28% and agree 33%) that they are doing enough to address cybersecurity needs. This contrasts with just 18% of those disagreeing (strongly disagree 7% and disagree 11%). While this suggests that cybersecurity needs are not acute, that is far from the truth.

FIGURE 5

IMPORTANCE OF DEVOPS FAMILIARITY IN THE OPEN SOURCE COMMUNITY

How important is it to be familiar with DevOps when working in the open source community? (Select one)

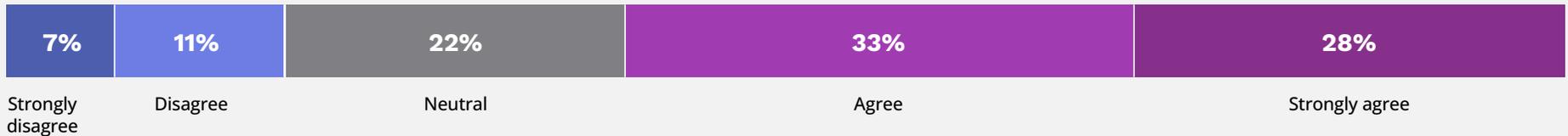


Q36, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,672

FIGURE 6

HOW OSPs THINK ORGANIZATIONS ARE DOING ABOUT CYBERSECURITY

Is the organization you work for doing enough to address its cybersecurity needs?



Q38, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,672, VALID CASES = 1,523. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

“One problem that we face is we don’t have qualified candidates who can work on DevOps. We get candidates who are very much into networking, and have depth but not breadth. We look for people who have a range of skills across networking, containers, CI/CD, Git, and development, with fundamental scripting knowledge. We tried to focus on that for DevOps. So, we probably missed the candidates who are very good at doing admin or networking tasks.”

—SENIOR DEVOPS ENGINEER



KEY TAKEAWAY

For the second year in a row, proficiency in cloud and container technologies surpasses Linux as the most desired skill set among hiring managers and professionals. DevOps has become not only the second most desirable skill set among open source professionals but also the most in-demand position to place among hiring managers.

An April 2022 Open Source Security Foundation (OpenSSF) survey focused on addressing the cybersecurity challenges in open source software found that when asked how secure their open source software and open source development processes were today, the weighted average of responses on a scale from 0 (poor) to 100 (excellent) was just 65.

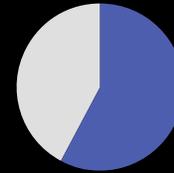
Despite the 61% of OSPs reporting that their organization is doing enough to address cybersecurity in FIGURE 6, it communicates the same fears as the OpenSSF survey did. The weighted average of responses in FIGURE 6 on a scale from 0 (all organizations strongly disagree) to 100 (all organizations strongly agree) is just 66.

Because there are hundreds of best practices that define how to perform secure software development, most organizations are exposed in many ways and the OpenSSF survey demonstrated that a leading cause was that organizations didn’t know what they didn’t know about cybersecurity.

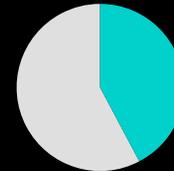
What is encouraging, however, is that 77% of professionals either strongly agree (38%) or agree (39%) that cybersecurity training and courses would be useful to them and their employer (FIGURE A6). ■

PART 3

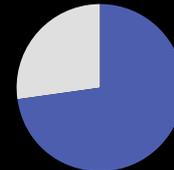
Talent Acquisition and Retention in 2022



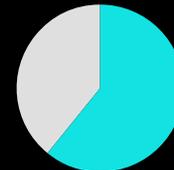
58% of hiring managers have given higher salary increases to retain open source talent.



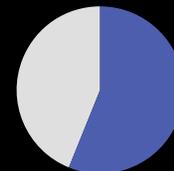
43% of hiring managers rely on training to grow employee skills.



73% of open source professionals believe it would be easy to find a new position.



67% of open source professionals say a salary increase would deter a job change.



62% of open source professionals say more employed paid training would help them succeed.

Talent Acquisition and Retention in 2022

It's no surprise that after three years of work isolation and burnout, some workers may be looking to see if there are greener pastures elsewhere. In our 2021 report, financial incentives became the most common means of keeping talent from leaving. In 2022, unsurprisingly, salary increases continue to be the primary tactic for encouraging staff retention.

FIGURE 7 shows that in 2022, 58% of hiring managers are giving open source talent higher salary increases than other business units receive in order to retain talent, up from 42% in 2021.

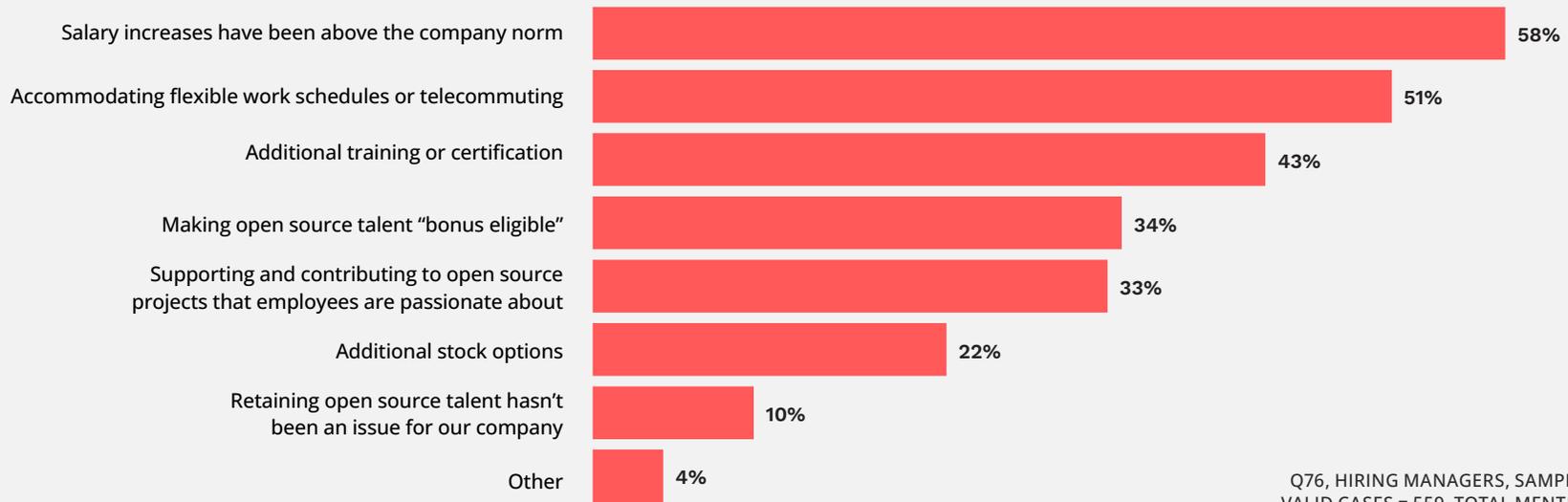
Additionally, 43% are offering training or certification opportunities as an incentive, and 34% have made open source staff "bonus eligible."

Also shown in FIGURE 7 is that 33% of hiring managers support open source projects that employees are passionate about. This support includes opportunities for working on open source during working hours, stipends for core contributions and maintenance/ownership of key open source projects important to the employee and/or the employer.

FIGURE 7

HOW EMPLOYERS ARE RETAINING OPEN SOURCE TALENT

Which of the following steps are you taking to retain open source-related talent? (Select all that apply)



Q76, HIRING MANAGERS, SAMPLE SIZE = 559,
VALID CASES = 559, TOTAL MENTIONS = 1,420.
"ALL OF THE ABOVE" RESPONSES HAVE BEEN REDISTRIBUTED

The Hiring Manager Point of View

Tactics for dealing with shortages of open source talent continue to evolve as shown in **FIGURE 8**. Many hiring managers (43%) state they are increasing training for existing employees to close the skills gap. Furthermore, 41% said they would hire consultants, a more expensive measure for solving staffing problems. The practice of searching until a close fit is found was practiced by 35% of hiring managers and increased by 85% over this same response in our 2021 survey.

The willingness to provide training or hire consultants implies that many employers have realized the “right” people may not be

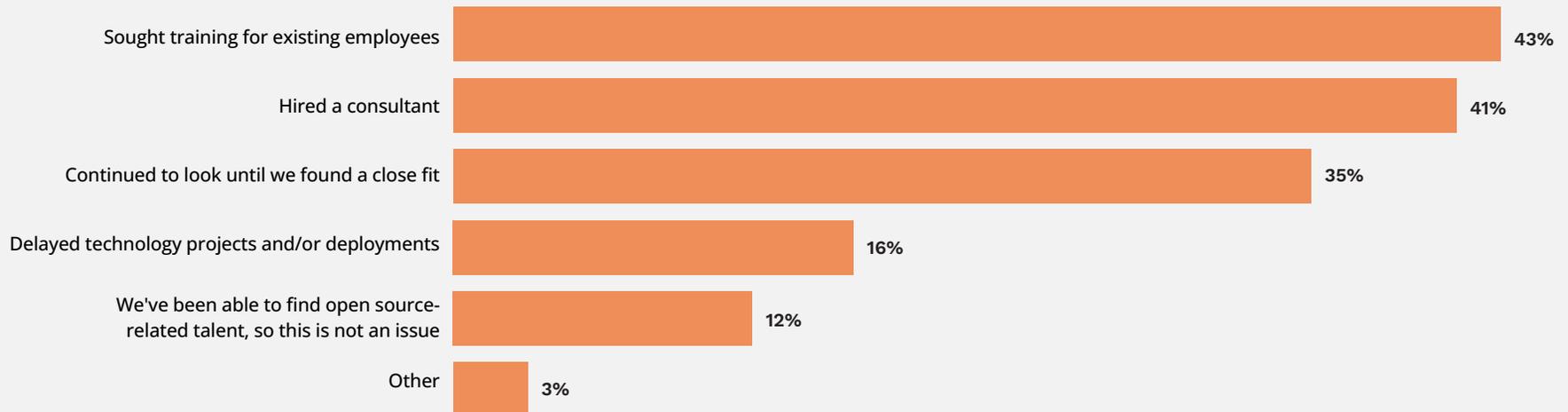
out there and they must consider alternatives rather than delay projects. Said another way, in 2022 organizations are less willing to delay projects because of talent shortages, with only 16% reporting doing so, a decrease from our 2021 survey.

If this trend continues, organizations with product launches and other release deadlines will see increasingly positive impacts to schedules and negative impacts to bottom lines. The reality may be the true price of the continuing skills gap is organizations have no choice but to proceed and they must hire expensive consultants to get work completed on schedule.

FIGURE 8

HOW EMPLOYERS COPE WHEN UNABLE TO FIND ENOUGH OPEN SOURCE PROFESSIONALS

If unable to find professionals with the open source-related skills you need, which of the following best describe how you have met your organization’s requirements? (Select all that apply)



Q78, HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 559, TOTAL MENTIONS = 837

The Open Source Professional Point of View

The majority of OSPs keep an open mind regarding new opportunities. 73% of OSPs believe it would be either very easy (18%) or fairly easy (55%) to find a new position (FIGURE A7). Likewise, 68% of OSPs would consider moving to a new employer in 2022 (FIGURE A8). Although 63% of open source professionals reported that their employment status has not changed (FIGURE A9), 33% did either resign or accept a new position in 2022 (FIGURE A10). With 33% of open source professionals either resigning and/or accepting a new position in 2022 the field has seen a major turnover that creates an increasingly difficult situation for employers.

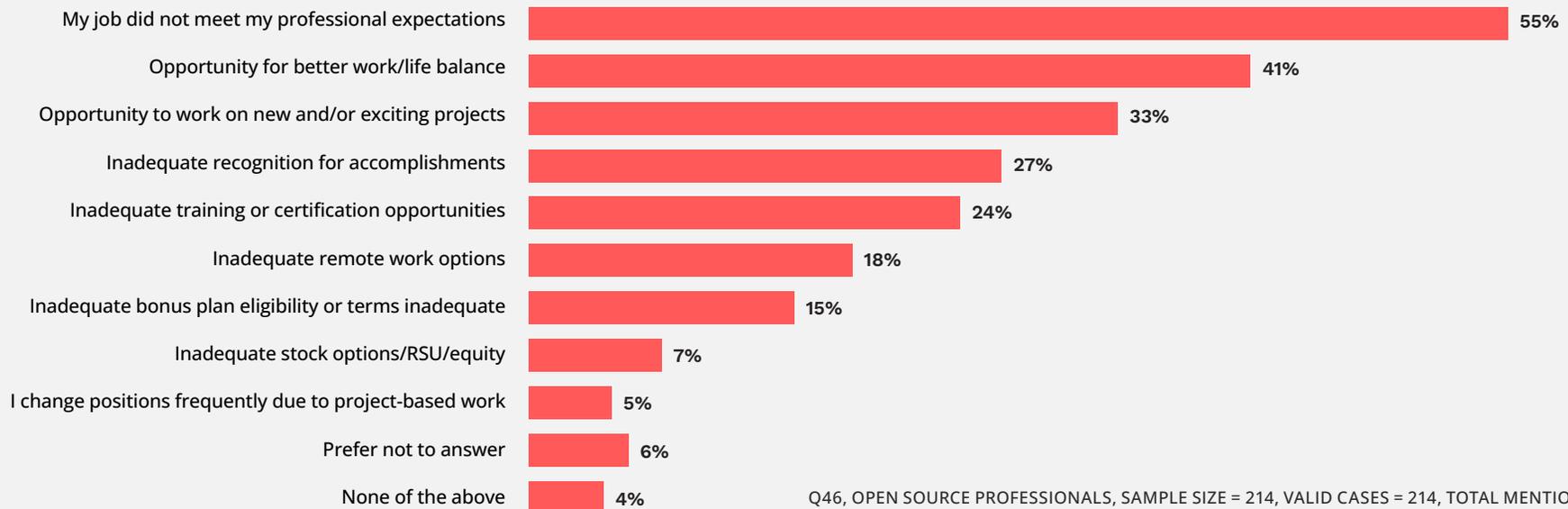
FIGURE 9 shows that the primary reasons for resigning from a position included 55% who said their job did not meet their professional expectations, 41% who found a better work/life balance, and 33% who found an opportunity to work on new and/or exciting projects. This seems consistent with the overall willingness to entertain new job opportunities, as burnout and a lack of work/life balance have forced many to consider their options.

The perception of the value of open source skills and ease of mobility reinforces that employers must redouble efforts to retain current staff and recruit new hires. To do so, employers should pay attention to what these professionals want. FIGURE 10 shows

FIGURE 9

REASONS FOR RESIGNING A POSITION

Why did you resign your position? (Select all that apply)



Q46, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 214, VALID CASES = 214, TOTAL MENTIONS = 503

“We do not have sufficient talent to satisfy our technology requirements. Due to strict nationalization schemes and a budget shortage, our management is now focusing on hiring fresh college graduates on low-salary packages.

We feel burnt out during peak activity times. Most of the current staff are fresh college graduates with no knowledge and skills to support our tasks. As the salary being offered is lower, most of the talented or experienced staff have left, and the ones who chose to stay have to take care of all the tasks.”

—DEVOPS ENGINEER

the top desired incentives that would prompt a professional to move jobs includes an increased salary (67%); followed by opportunities to work on new and exciting projects (38%); improved work/life balance (36%); and flexible work arrangements (30%).

Changes to Culture

FIGURE 11 shows that 61% of open source professionals surveyed stated that their organization is embracing and extending remote work equitably across the workforce. Additionally, 30% are providing services to support employee wellbeing, and 28% are establishing clear rules, expectations, and self-governance tenets for remote workers. These activities clearly indicate that the remote paradigm is firmly establishing itself as the de-facto work culture today.

FIGURE 10

INCENTIVES EMPLOYERS CAN USE TO COUNTER OPEN SOURCE PROFESSIONAL RESIGNATIONS

Select the top incentives that would PRIMARILY deter you from moving to another employer? (Select up to three)

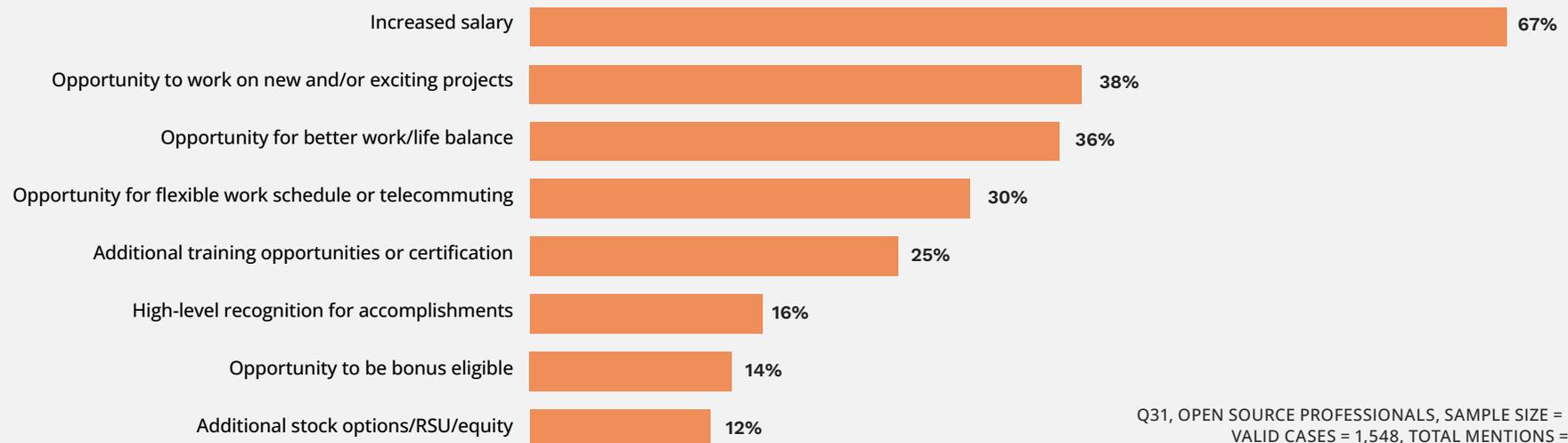
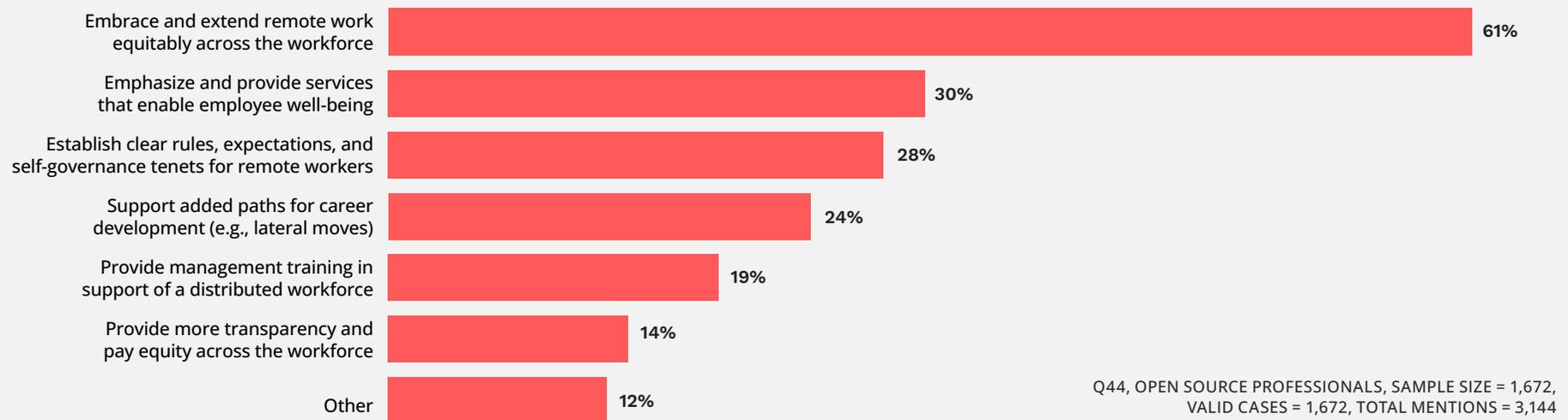


FIGURE 11

EMPLOYER ACTIONS TO SUSTAIN EMPLOYEE MOTIVATION

As the world approaches a post pandemic reality, what specifically is your employer doing to sustain employee motivation? (Select all that apply)



With remote work being commonplace in this new reality, organizations must find new ways to differentiate themselves from a benefits perspective to attract new employees. OSPs were asked what their employers could do to make them more successful in

their roles. FIGURE 12 shows that the top request is for employers to sponsor training opportunities at 62%, followed by covering the costs of certifications at 52%. Attending technical conferences and events dropped to third place from its second place position in 2021, at 50%. This drop indicates the pandemic still makes people travel averse despite the recent loosening of restrictions in many parts of the world. Additionally, 44% would appreciate the ability to set aside work time to contribute to open source projects, demonstrating that employers need to enable their teams to work on projects they are passionate about to increase engagement.

One of the most significant challenges that open source professionals identified in the survey is a lack of training opportunities. FIGURE 13 shows that 44% of OSPs said they lacked training

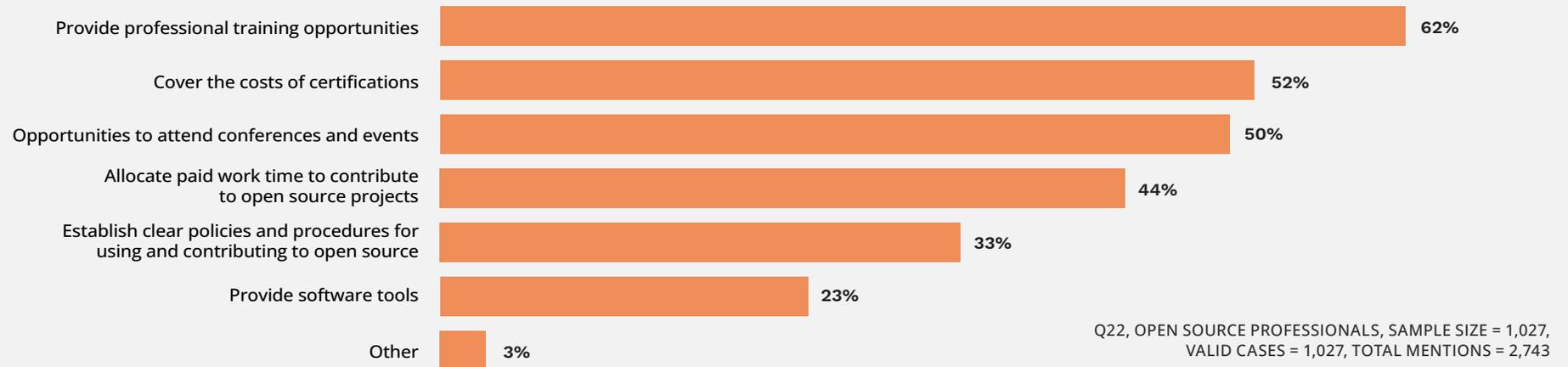
“I do not have every resource that I need to function in my current role. I am using Python FastAPI, OpenFaaS, drone.io, and CI pipeline with limited resources on the internet except the documentation. Some formal training and dedicated time to learn these tools would be helpful to understand the architecture of the project. Currently, I am learning by doing my job.”

—OPEN SOURCE CYBERSECURITY ENGINEER

FIGURE 12

OPEN SOURCE PROFESSIONAL NEEDS FROM EMPLOYERS

What can your employer do to make you more successful? (Select all that apply)



opportunities. The second-most significant challenge is departmental siloing (32%). The large concern for siloing indicates continued difficulty or inexperience in using remote toolsets (instant messaging, video conferencing, web-based project management, office productivity tools, group calendaring, and traditional email) to facilitate communication between departments. Other concerns include a lack of documentation for open source projects (29%) and difficulty obtaining buy-in from management to use open source (29%).

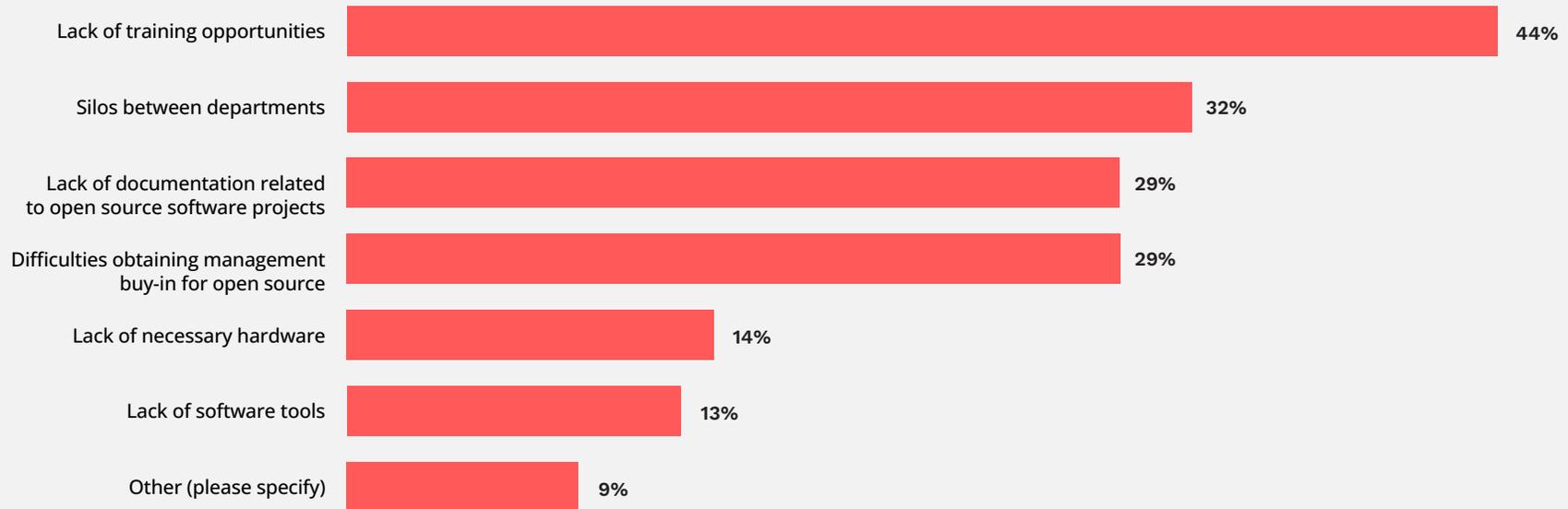
The Linux Foundation Perspective

Over the last three years, the pandemic has led to permanent changes in open source workplaces. During the height of COVID, professionals specifically sought out environments which were using remote work as differentiators or were more permissive and flexible towards working arrangements.

FIGURE 13

THE BIGGEST CHALLENGES FACED BY OPEN SOURCE PROFESSIONALS

What are the biggest challenges you face? (Select all that apply)



Q23, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,027, VALID CASES = 1,027, TOTAL MENTIONS = 1,740

Now, OSPs simply expect their jobs to be remote. Organizations can no longer differentiate and attract employees to their culture with the promise of remote work and improved work/life balance.

Perhaps it is time to fight the war for talent by returning to a key basic: financial compensation. The current trend of global inflation only adds to the need to address salary, bonus, profit share and other financial incentives as a means to increase retention and support recruitment.

“Currently, I am managing the HPC environment, VM environment, DevOps, repositories, and CI/CD pipelines, Kubernetes environment, and the PostgreSQL DB setups. Our organization currently doesn’t focus on retaining the existing talent. Hopefully, in the future, they will come up with a plan — when they sustain noticeable losses due to a lack of talented individuals.”

—DEVOPS ENGINEER

The Educational Advantage

FIGURE A11 shows that just 19% of OSPs do not have a four year college degree, 43% do have a college degree, and 37% have an advanced degree. This means that 80% of OSPs have at least a four year college degree, which suggests that while a college education is not essential for career success, it is the norm.

Why an Open Source Career?

Smart organizations recognize that open source professionals choose their career paths for two fundamental reasons that should be considered across all recruitment and retention efforts:

- To work on the modern edge of technologies (63%)
- Long-term career success (39%)

What drives open source professionals' job satisfaction?

- Providing professional training opportunities (62%)
- Covering the costs of certifications (52%)
- Providing opportunities to attend conferences and events (50%)
- Allocating paid work time to contribute to open source projects (44%)

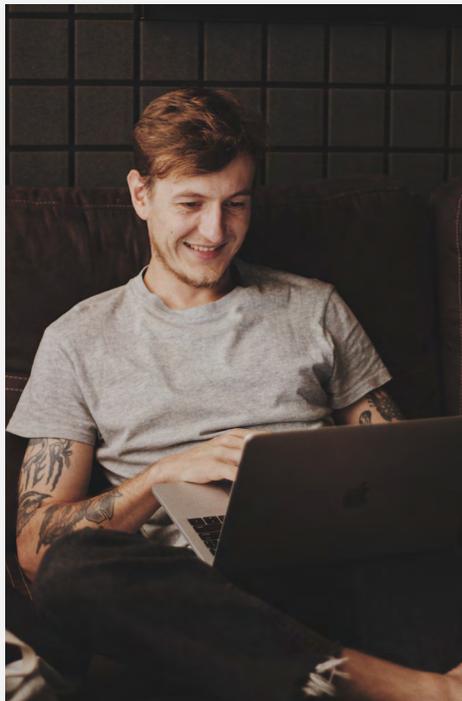


PHOTO BY OLEG IVANOV ON UNSPLASH

- Establishing policies and procedures for using and contributing to open source projects (33%)

What are employers actually doing? Here's what satisfied professionals say:

- Embracing remote work: 61%
- Emphasizing services that enable well-being: 30%
- Establishing clear rules for remote workers: 28%
- Supporting added paths for career development: 24%
- Providing management training in support of a distributed workforce: 19%
- Providing more transparency and pay equity: 14%

And here's what hiring managers say they are doing:

- Salary increases above company norm: 58%
- Flexible work schedules/telecommuting: 51%
- Training/certification: 43%
- Bonus opportunities: 34%
- Supporting/contributing to open source projects professionals are passionate about: 33%
- Additional stock options: 22%



When hiring managers were asked how important it was for a candidate to have a college/university education, their responses were more accommodating. A total of 25% said that a college education was either not very important (18%) or not at all important (7%) (FIGURE A12). Alternatively, 75% of hiring managers said that it was important for candidates of open source positions to have a college/university degree, with 19% saying extremely important; 24% very important; and 32% somewhat important (FIGURE A12). OSPs without a university degree appear to be an industry minority.

As the cost of living rises — including the costs of higher education — hiring OSPs becomes more expensive. One proven effective way to control staffing costs is to build skills through training of existing teams, which has the added benefit of improved retention.

Organizations will need to adopt an all-encompassing approach to talent development and retention. Over the past year, at the Linux Foundation Training & Certification, we've seen a continued emphasis on using self-paced eLearning, combined with certification, to upskill and cross-train existing teams. While this is positive progress, more needs to be done to upskill existing talent and grow the talent pool at the entry-level, in order to provide a ready pipeline of talent to upskill. ■

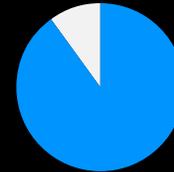
KEY TAKEAWAY



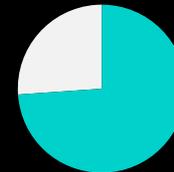
Recruiting and retaining qualified professionals has been the top priority for almost three years since Covid.

PART 4

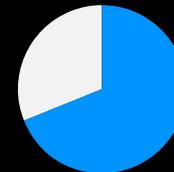
Training and Certification in 2022



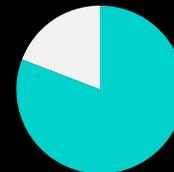
90% of hiring managers are willing to pay for certifications.



74% of open source professionals proactively ask for training.



69% of hiring managers are more likely to hire certified open source professionals.



81% of open source professionals plan to add certifications in 2022.

Training & Certification in 2022

Training programs have become essential to helping employers meet skills requirements when they cannot find talent. It also helps increase retention.

As mentioned earlier (FIGURE 8 on page 17), most hiring managers (43%) report that they have trained existing staff in new technologies to close the talent gap. In fact, the use of training as a means to manage the skills and talent gap persists because the alternatives include hiring outside professionals (41%), waiting to find the right person (35%), and delaying new projects (16%). Additionally, 41% said they would hire consultants, a more expensive alternative to solve staffing challenges, an increase from 2021 (37%).

This sharp increase in willingness to hire consultants reflects the unwillingness to continue to delay technology projects and deployments (16%) or wait for the “right” permanent hire (35%). These data points provide a clear indication that business transformation must move forward, and organizations will do what they need to ensure success.

The Hiring Manager Point of View

FIGURE 14 shows that the increased desire for certified talent has encouraged companies to sponsor their employees’ certification efforts over the past several years. In 2022, 90% of hiring managers reported being willing to pay for certifications. This value has remained around 90% over the last two years and the willingness of employers to sponsor employee certifications is consistent with the preference of hiring managers to hire certified professionals. 69% of hiring managers said that they are more likely to hire a certified OSP compared to just 28% who said it would not influence their decision and 5% who would be less likely to hire a certified OSP (FIGURE A13).

Supporting the pursuit of certifications helps with recruiting and it also is an essential retention tool. In many cases, certifications



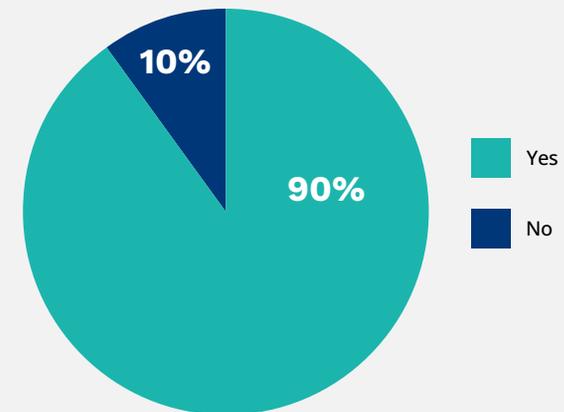
KEY TAKEAWAY

69% of hiring managers are more likely to hire someone with a certification.

FIGURE 14

EMPLOYERS ARE WILLING TO UNDERWRITE CERTIFICATION COSTS

Would you be willing to provide financial assistance to help your employees obtain certifications? (Select one)



Q63, HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 413. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

can make a company more competitive, enabling them to tout the many certified IT professionals on its team to current and prospective clients. Real world experience reinforces this finding. Corporate bulk purchases of the Linux Foundation exams are up more than five times in 2021 compared to 2019.

OSPs are onboard with training and certifications as well. Hiring managers report existing employees are increasingly asking for, or proactively taking training, with 74% reporting an increase in the past year (FIGURE A14).

When selecting open source training providers, companies are

looking for vendor neutrality. A substantial majority of hiring managers (78%) state that a training provider for open source tech must be vendor-neutral, similar to the results in the last two reports (FIGURE A15). With vendor lock-in always a concern, companies recognize that they need IT talent who understand the core of the technology, not just a specific iteration.

The Open Source Professional Point of View

The 64% increase in hiring managers' willingness to pay for certifications over the last four years is partly driven by the employees who increasingly see the value in certifications. The vast majority of OSPs (94%) believe certifications are helpful to their careers (FIGURE A16).

“Our organization does provide technical training via online subscriptions to LMS channels like LinkedIn learning. However, this training generally lacks hands-on sessions and one-on-one interaction with instructors – which in my sense is essential to keep pace with rapid advancements in the field.”

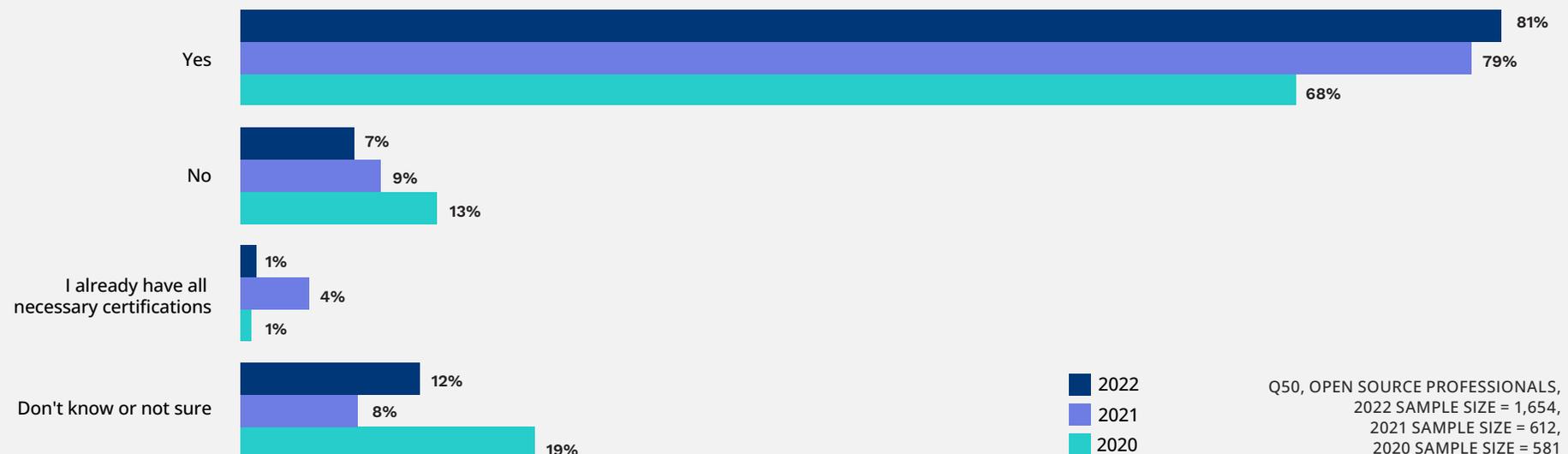
—DEVOPS ENGINEER

Certification activity is holding steady, FIGURE 15 shows that 81% of OSPs plan to take a certification exam this year, up slightly from 79% in 2021, and 68% in 2020.

FIGURE 15

OPEN SOURCE PROFESSIONALS TAKING CERTIFICATION EXAMS IN THE NEXT 12 MONTHS

Are you considering taking any certification exams in the next 12 months? (Select one)



Most hiring managers (72%) state that formal training and certification are a priority in evaluating candidates for positions (FIGURE A17). A majority of OSPs (65%) also stated that being able to demonstrate their abilities to their employer was a primary benefit of certification. Additional benefits for OSPs include increased employability (64%) and the ability to command higher salaries (41%) (FIGURE A18).

When asked what employers could do to help them be more successful, OSPs said they want additional training opportunities, with 62% selecting this option, followed by covering the costs of certifications at 52% (FIGURE 12). Technology is advancing rapidly,

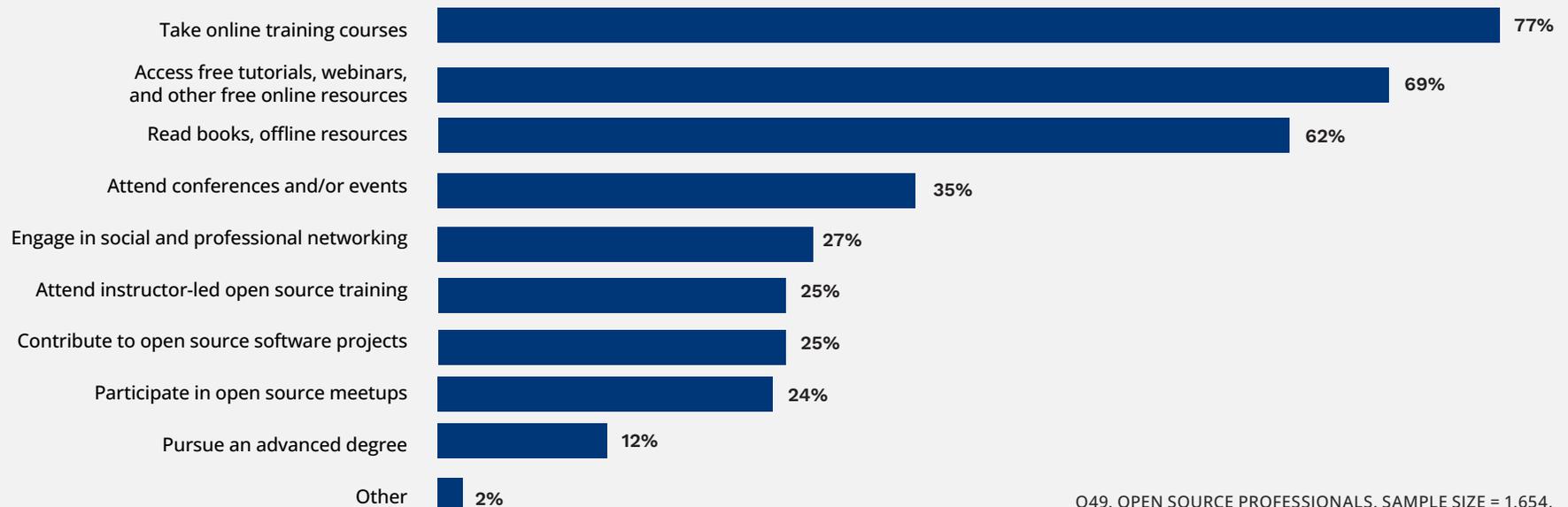
and OSPs know they need to keep their skills sharp for job and career success.

FIGURE 16 shows that OSPs get a significant amount of their professional development via free, online sources (69%). Taking online training courses — free or paid was reported by 77% of OSPs. The numbers attending conferences, meetups, or other events have dropped to 35% in the past year, reflecting a continued reluctance to travel despite improving conditions, lifting mandates, and lowering health advisories. This reduced desire to attend live events makes online training even more essential to make up for fewer in-person conferences and other in-person continuing education opportunities.

FIGURE 16

HOW OPEN SOURCE PROFESSIONALS INTEND TO KEEP THEIR SKILLS UP TO DATE

How do you plan to keep your skills up-to-date in the next six months? (Select all that apply)



Q49, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,654,
VALID CASES = 1,654, TOTAL MENTIONS = 5,928

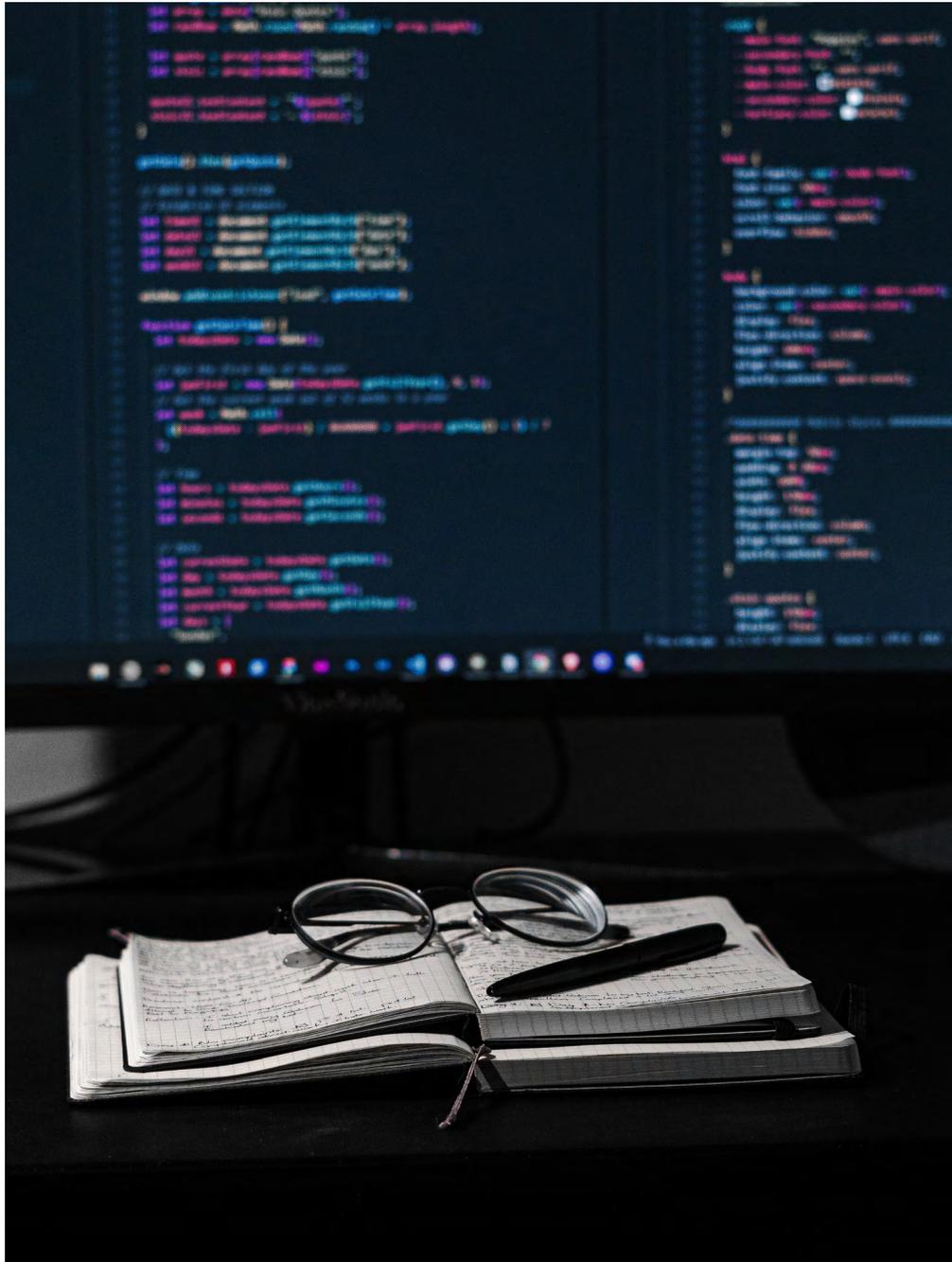


PHOTO BY KEVIN CANLAS ON UNSPLASH

The Linux Foundation Perspective

The importance of certifications shows a strong alignment between hiring managers and OSPs. Certifications allow employers to verify — and OSPs to demonstrate — abilities that may be tough to establish when dealing with new technologies. Another contributing factor to the increase in certifications is the recognition that they represent a way for OSPs to establish themselves as experts with cutting-edge technologies, which is critical to job and career success given the increasingly fast pace of technological change.

Data from the Linux Foundation's Training and Certification catalog usage patterns bears this out. Since the fourth quarter of 2019, the number of monthly certification exams delivered by the Linux Foundation has more than tripled and continues to grow. Also worth noting for hiring managers, candidates schedule their exams much closer to the point of purchase. Historically candidates purchased in advance and had to be prompted to complete their exams. This indicates increased seriousness towards, and importance of, certifications to OSPs. ■

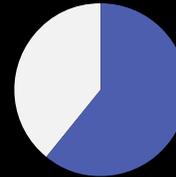
KEY TAKEAWAY



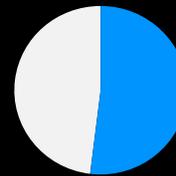
OSP want training and certifications. Hiring managers see certifications as essential verifiers to ensure roles are filled with qualified professionals. Both groups see it as a positive for improving retention.

PART 5

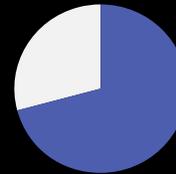
The Value of Architecting, Deploying, and Developing Open Source Software in 2022



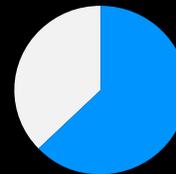
67% of hiring managers seek open source professionals with architectural skills.



52% of hiring managers attribute the demand for open source professionals to business growth.



71% of open source professionals say the ability to architect is key.



63% of open source professionals believe open source runs most modern technology.

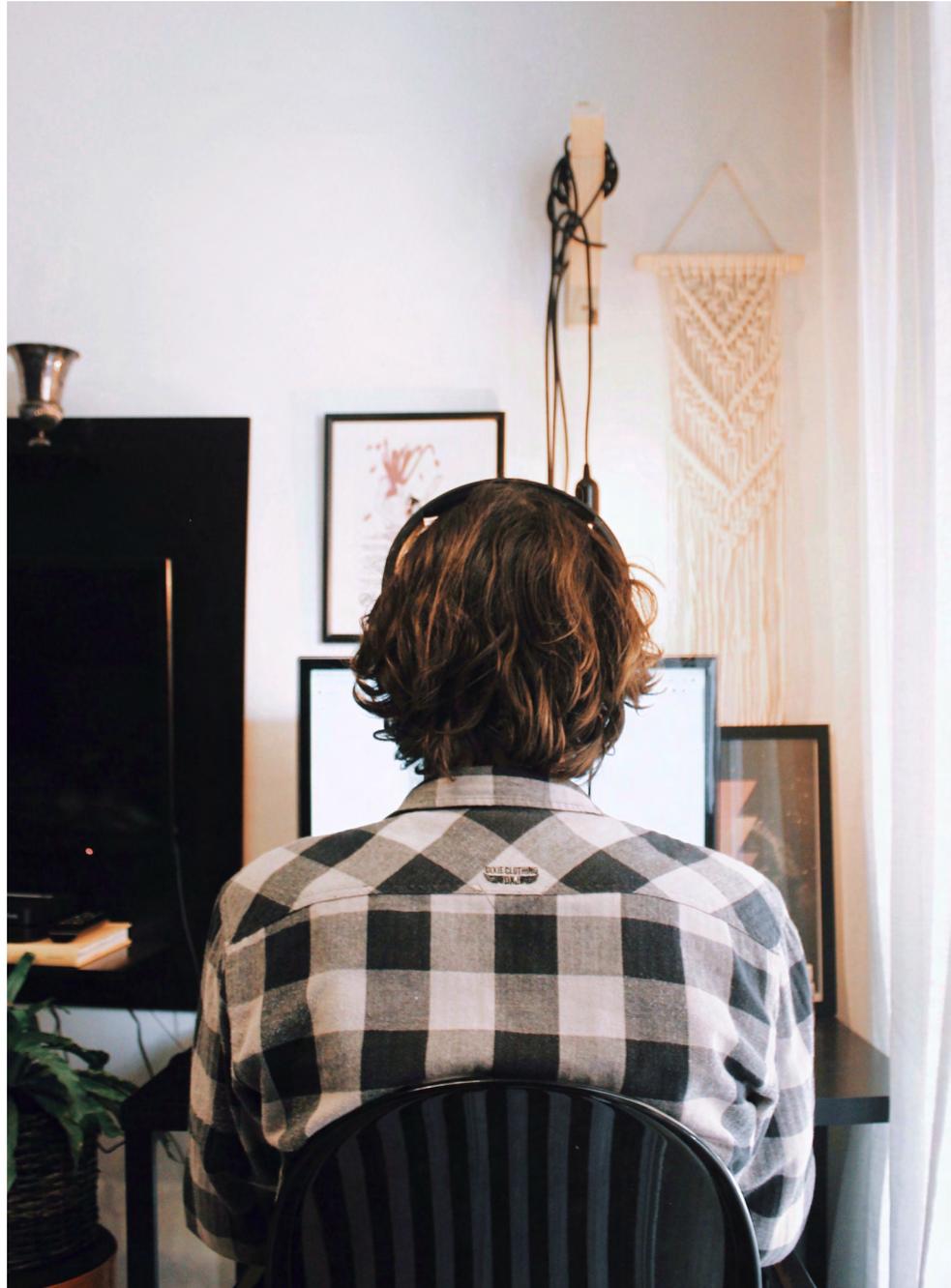


PHOTO BY NATHANA REBOUCAS ON UNSPLASH

The Value of Architecting, Deploying, and Developing Open Source Software in 2022

Organizations continue to recognize the value of open source projects and hire those who have worked on them. This year, we saw significant priority changes in the overall demonstrated experience that hiring managers are looking for in prospective OSPs. In 2022, it's all about architecting, deploying, and developing open source solutions.

The Hiring Manager Point of View

The overwhelming desire to implement critical digital transformation projects is reflected by the increased reluctance in 2022 to delay them (16%), potentially train up staff to address needs (43%), hire consultants, if necessary (41%), or redouble efforts to find a candidate and get them hired (35%) (FIGURE A19).

FIGURE 17 shows what hiring managers want from new OSP hires. Most important in 2022 is the ability to architect solutions based on open source software (67%); followed by the ability to deploy open source software (44%); experience with software development (42%); and knowledge of new tools (33%). This indicates that organizations are more in need of OSPs that can bring a big picture view to direct and deploy open source solutions than those that make direct project contributions.

KEY TAKEAWAY

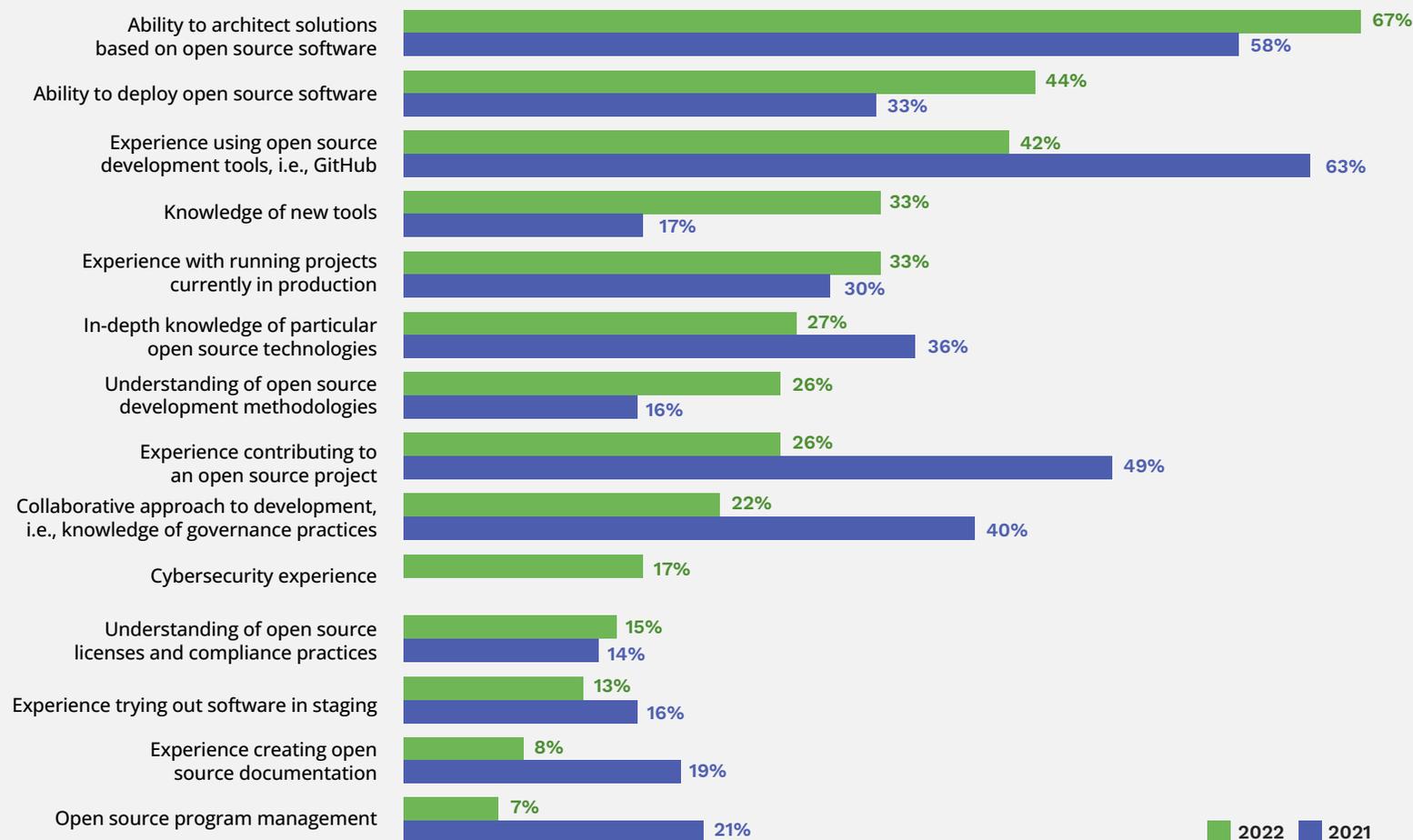


Hiring managers seek professionals with the abilities to architect solutions (67%); deploy applications (44%); develop open source software (42%); and knowledge of new tools (33%).

FIGURE 17

WHAT OPEN SOURCE PROFESSIONAL SKILLS INFLUENCE A HIRING DECISION

When seeking open source professionals, which skills are most important in influencing a hiring decision? (Select all that apply)



Q69, HIRING MANAGERS, 2022 SAMPLE SIZE = 559, 2021 SAMPLE SIZE = 522

There are some significant changes in hiring manager requirements between 2021 and 2022. Key hiring manager priorities for 2022 included the ability to architect solutions based on open source (67%) and this was also a leading priority in 2021 (58%). Deployment skills were the second priority in 2022 at 44% which increased considerably in priority from 2021 when they were the sixth priority. This suggests the importance of not just understanding architecture but also the realities that applied architecture has on application development and deployment.

The importance of experience in 2022 — in using open source tools (42%); knowledge of newer tools (33%); and knowledge of

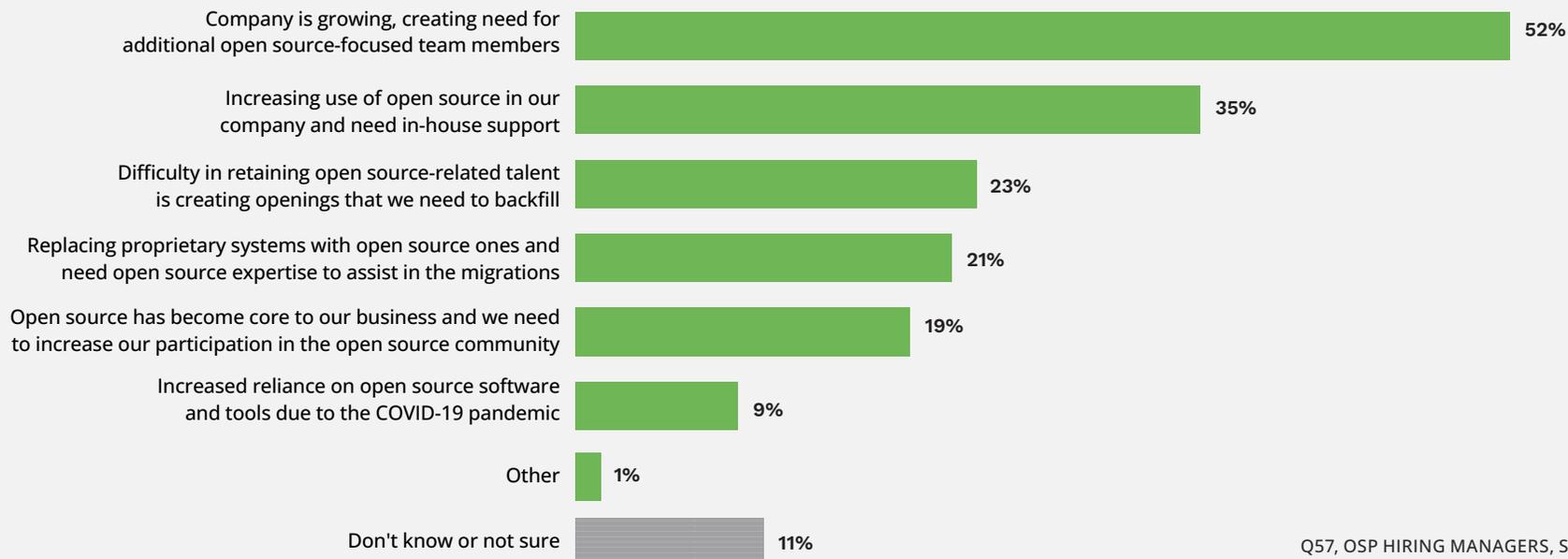
how projects run in production (33%) — continues to reinforce the value that hiring managers now place on full-lifecycle skills from design through development and deployment. This was far less the case in 2021 when hiring manager priorities included using open source development tools (63%); experience in participating in open source projects (49%); and project collaboration/governance skills (40%).

The changing priorities of hiring managers is linked to changing organizational needs. **FIGURE 18** identifies the key changes in 2022 that are shaping the skills now seen as important for open source professionals to have.

FIGURE 18

ORGANIZATIONAL CHANGES DRIVING OPEN SOURCE PROFESSIONAL HIRING

What has changed at your or your clients' organization(s) that is driving the hiring of open source professionals in 2022, as opposed to 2021? (Select all that apply)



Q57, OSP HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 559, TOTAL MENTIONS = 956

FIGURE 18 indicates that 52% of hiring managers report that organizational growth is a primary driver for why OSPs are being hired. Business growth means more customers, more ways to support customers, more products, and a host of new demands on IT. Direct support for organizational growth is aligned with the 2022 demands shown in FIGURE 17 that focus on open source development, deployment, and operations (production systems). Because FIGURE 18 also shows that 35% of organizations (using hiring managers as a proxy) are increasing their use of open source (in addition to growth-based increases) this is compounding the growth in open source at many organizations.

Retaining open source talent, at 23%, is actually more acute than this metric suggests given the number of OSPs in this survey that changed jobs in 2022. Staff mobility and increased willingness to find new employment provide additional evidence of increased turnover, more a “great reevaluation” than a “great resignation.”

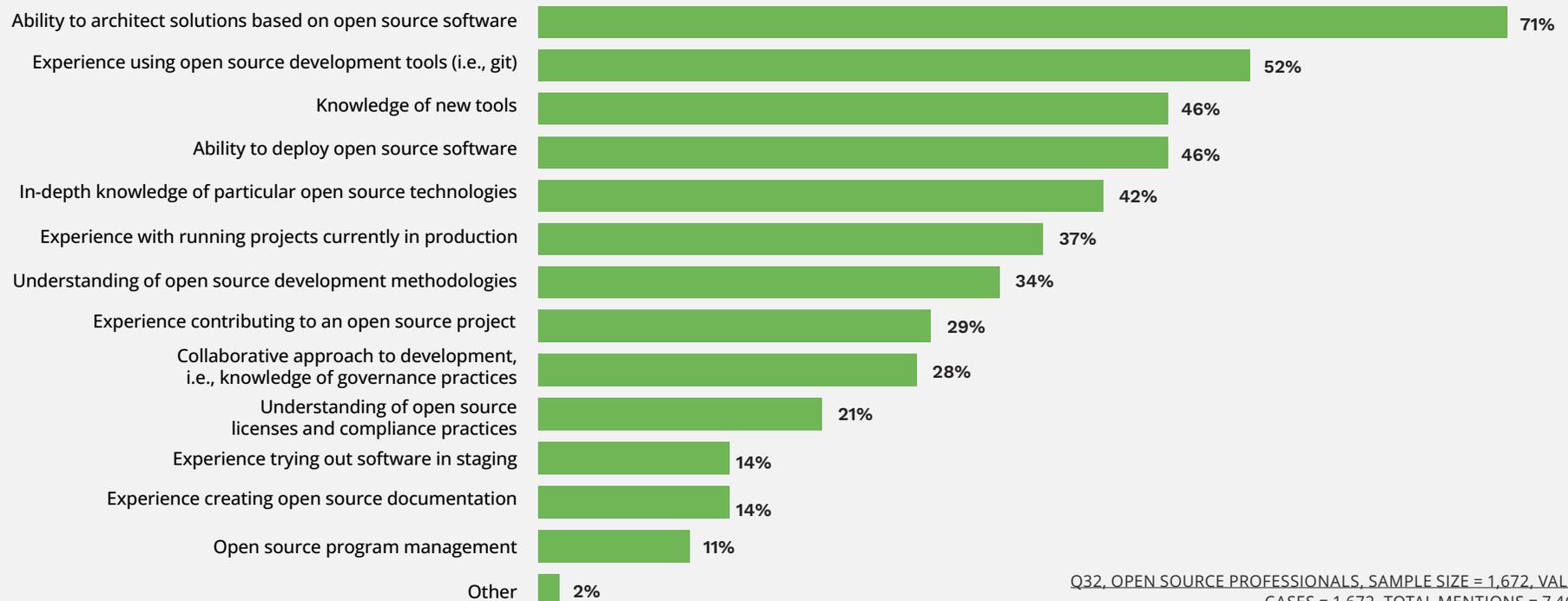
The Open Source Professional Point of View

OSP ranked their most important skills in lockstep with hiring managers as shown in FIGURE 19. The ability to architect solutions based on open source software ranked as the most valuable skill

FIGURE 19

THE MOST VALUABLE OPEN SOURCE SKILLS

What open source skills do you believe are most valuable in today’s job market? (Select all that apply)



at 71%. Experience using open source development tools ranked second at 52% and the knowledge of new tools ranked third at 46%.

The top reason open source professionals report that they pursued an open source career is shown in **FIGURE 20**. 63% said this was because open source runs most of our modern technology infrastructure. This aligns with the leading skill set in **FIGURE 19**.

This increase may be evidence of open source being seen as a more lucrative technology area as it has become dominant. The pandemic forced other changes to work practices, such as enabling more remote work and flexible hours. But if most jobs are going to be flexible on work locations and times anyway, compensation becomes a primary differentiator. The ability to

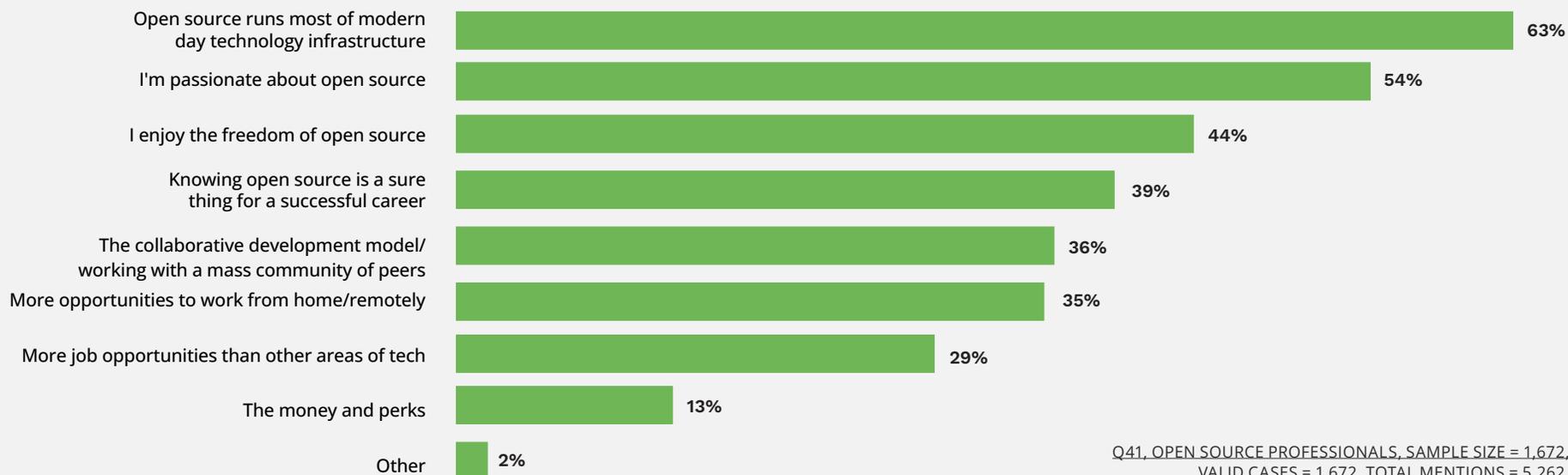
work remotely and at home ranked sixth at 35% in **FIGURE 20**. It's clear this has become less of a perk and more of a boilerplate requirement in the information technology field.

When open source professionals were asked about the best aspects of their job, the leading responses were collaboration with a global community (21%) and interesting projects (21%) (**FIGURE A20**). Working on cutting-edge technology ranked third at 16% (**FIGURE A20**). Despite the lucrative opportunities in open source, job stability (6%) and money and perks (4%) ranked at the bottom (**FIGURE A20**). Part of this is a need for mobility to drive up compensation — but perhaps the low response to money and perks means that the interesting aspects of a career in open source are also a significant draw.

FIGURE 20

WHY RESPONDENTS CHOSE A CAREER IN OPEN SOURCE

Why did you or why are you seeking an open source career? (Select all that apply)



“Why am I staying at my current job? First off, the pay is good. Second, I learn a whole lot. So, earn and learn, that’s a win! Besides that — we are working in a truly Agile way, with no micromanagement. The company is going cloud-only, so no more legacy on-premises stuff. We work with all the cool cloud native stuff — K8s, Prometheus, Grafana, Instana, Kafka, Loki, Linux, PostgreSQL, Cosmos DB, and others. We have excellent cooperation with the product teams, and upper management is also visible and transparent.”

—OPEN SOURCE CLOUD ENGINEER



KEY TAKEAWAY

In 2022, for open source hiring managers and professionals, it’s all about architecting, deploying, and developing open source software.

The Linux Foundation Perspective

Often, internal professionals contribute and maintain open source software code on behalf of their employers, sometimes as a hobby project. This attraction to work on open source projects has been so strong in the past that companies have lost employees to competitors who more successfully exploited open source software.

Companies that allowed and encouraged professionals to participate in the open source software community during business hours tended to recruit and retain the brightest talent, even in a tight labor market such as we are now experiencing. Even though compensation ranks higher than open source contribution in 2022,

there is still evidence employers would benefit from giving teams time to collaborate with open source communities outside of their specific workplace. Additional benefits of this approach include improved morale and opportunities for OSPs to gain knowledge and insights useful in their day-to-day work.

As we saw in FIGURE 12, 44% of open source professionals would like their employer to allocate some paid work time to contribute to open source projects; 33% want clear policies for using and contributing to open source projects; and 23% would like employer provided tools. Based on our 2022 data, efforts over the past several years to give employees more time to work on open source projects may now be paying off.

Organizations across all industries are increasingly adopting open source technologies and programs. Open source software is no longer limited to early adopters; instead, it has become a way of life for many businesses. Many organizations have already passed the point where they simply consume open source software; they are now willing to be actual contributors in the development process.

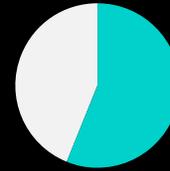
Open Source Program Offices (OSPOs) are being established to align efforts across their organizations with management systems and policies designed to create a positive experience for internal professionals, external participants and the communities in which they participate. ■

PHOTO BY SIGMUND ON UNSPLASH



PART 6

Diversity, Equity, and Inclusion in 2022

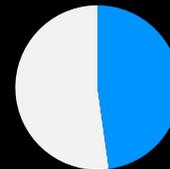


62% of organizations employing open source professionals encourage diversity in hiring.

Organizations that encourage diversity in hiring are

2.5 times more likely

to support diversity-focused industry initiatives.



48% of open source professionals and hiring managers rate their employer diversity efforts as good or excellent.



Diversity, Equity, and Inclusion in 2022

Diversity continues to be a “work in progress.” While most organizations do proactively encourage diversity in their hiring efforts, there are still a significant number of firms who do not. In addition, there are people who simply aren’t in roles that enable them to have awareness of their organizational policy or actions.

Progress is Visible

FIGURE 21 shows that hiring managers and OSPs believe most organizations are proactively encouraging diversity in hiring. Looking at the results, 62% of hiring managers and OSPs said their organization encourages diversity in hiring; 13% said they were not proactively encouraging diversity in hiring; and 25% are not able, because of their role or environment, to have awareness of organizational policy on diversity. The 62% is an encouraging finding, but accelerating growth in organizational diversity requires a higher level of visibility about and into its importance. The 25% other is interesting in that there are a number of reasons why a person might select this response. The respondent might be unemployed, self employed, or employed by a very small company, or just might not have visibility into the employer’s approach to diversity.

FIGURE 21

DOES YOUR ORGANIZATION PROACTIVELY ENCOURAGE DIVERSITY IN HIRING?

Does your organization proactively encourage diversity in hiring efforts? (Select one)



Q85, OPEN SOURCE PROFESSIONALS AND HIRING MANAGERS, SAMPLE SIZE = 1,281, VALID CASES = 1,281

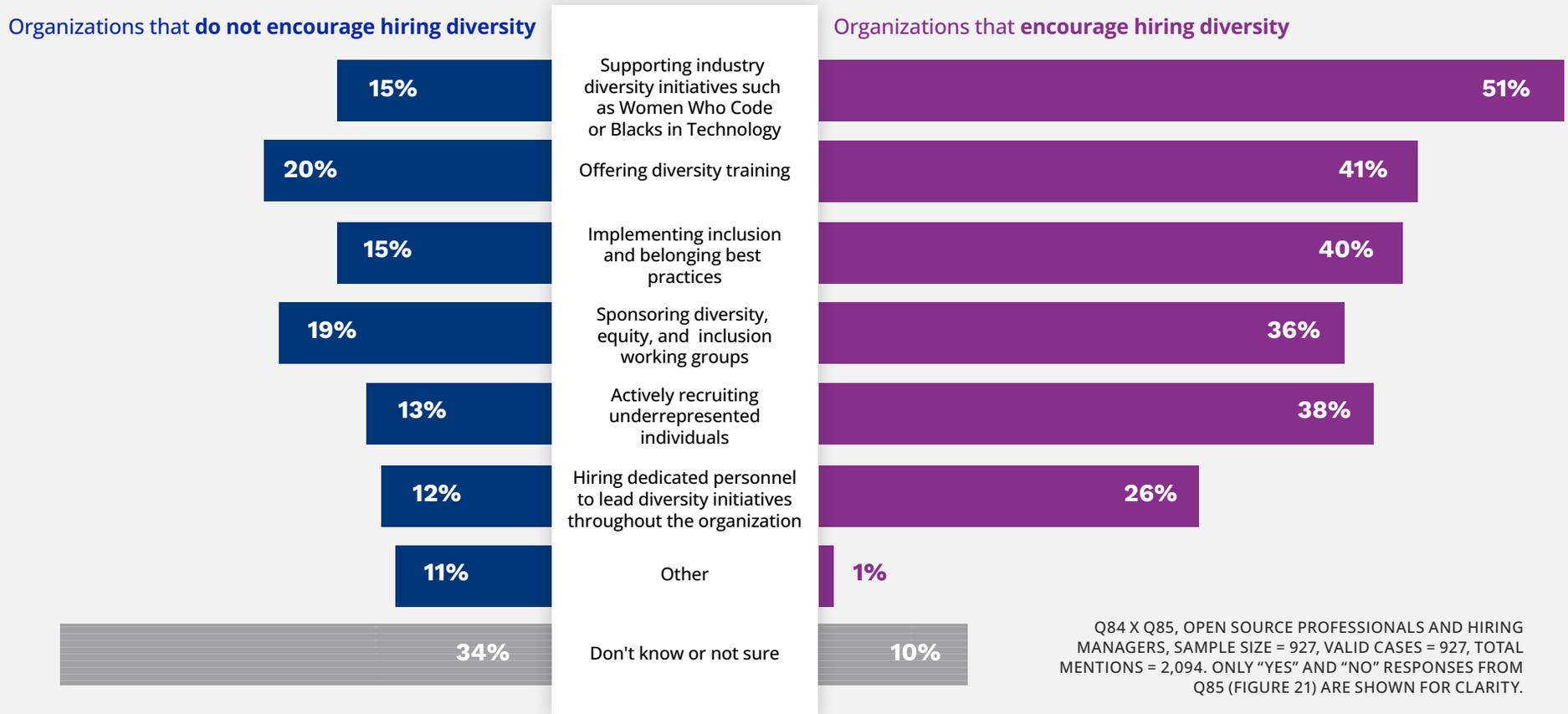
25% is a significant number of people, and if we were to exclude them from the analysis, the 62% of organizations that encourage diversity in hiring would increase to 83%. For this reason we can be optimistic about the progress that diversity is making — but until we have additional research, the 62% seems prudent.

More Progress on DEI Initiatives is Needed

In order to better assess some of the ways that organizations are addressing diversity needs, we have segmented FIGURE 22 by FIGURE 21. This allows us to better understand the difference in diversity initiatives based on how organizations hire. There is a

FIGURE 22
PROGRESS BEING MADE ON SELECTED DEI INITIATIVES

What types of diversity, equity, and inclusion initiatives does your organization engage in? (Select all that apply) by Does your organization proactively encourage diversity in hiring efforts? (Select one)



marked difference in the level of support for diversity initiatives based on hiring practices. FIGURE 22 shows that organizations that encourage diversity in hiring are materially involved in diversity initiatives such as Women Who Code or Blacks in Technology (51%); diversity training (41%); inclusion and belonging best practices (40%); and active recruitment of underrepresented individuals (38%). Organizations that do not encourage diversity in hiring do embrace diversity initiatives to some extent. This means that diversity initiatives are finding their way into organizations organically independent of their hiring policy. This is very encouraging and shows that diversity initiatives can occur both top down and bottom up within the organization's initiatives.

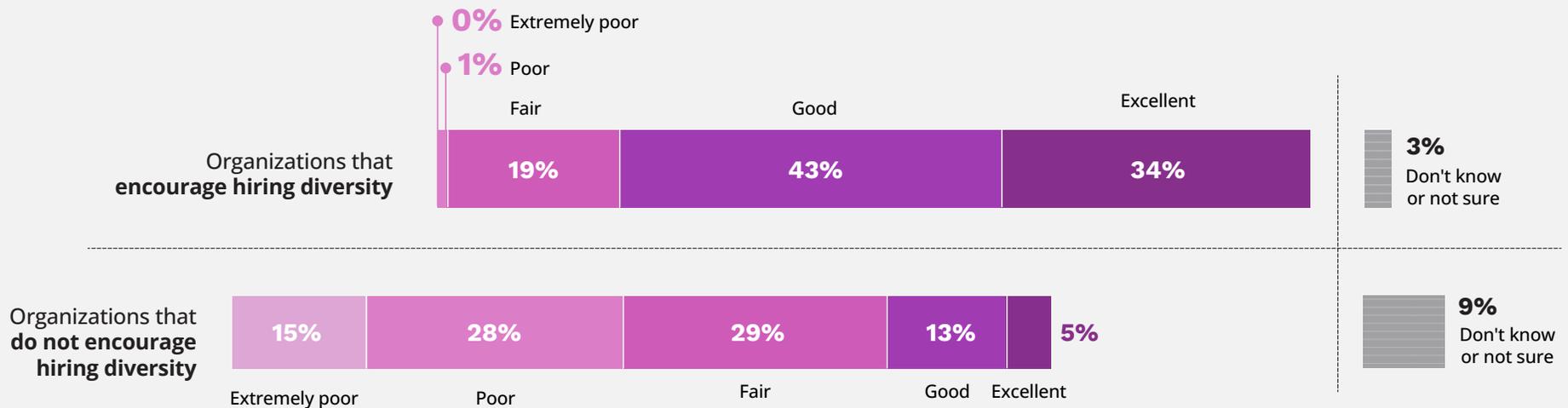
Across-the-board increases in diversity, equity, and inclusion practices are positive developments, but more is needed.

Organizations willing to invest in pursuing and providing extra support to encourage success for underrepresented communities in the tech community could end up being the biggest winners of all in the talent acquisition game.

Feedback from OSPs and hiring manager efforts to address diversity segmented by hiring diversity is shown in FIGURE 23. The rating distributions in FIGURE 23 show distinctly different patterns. Of those organizations who encourage diversity in hiring, 34% rate their diversity efforts as excellent; 43% good; 19% fair; and 1% poor. This contrasts with organizations who do not encourage diversity in hiring where 5% rate their diversity efforts as excellent; 13% good; 29% fair; 28% poor; and 15% extremely poor. While 43% of organizations who do not encourage diversity in hiring were rated as either poor (28%) or extremely poor (15%);

FIGURE 23 RATING YOUR ORGANIZATION'S DIVERSITY EFFORTS

How would you rate your organization's diversity efforts? (Select one)



Q86 X Q85, OPEN SOURCE PROFESSIONALS AND HIRING MANAGERS, SAMPLE SIZE = 952. ONLY "YES" AND "NO" RESPONSES FROM Q85 (FIGURE 21) ARE SHOWN FOR CLARITY.

these organizations only account for 6% of the overall sample (43% X 13%). This contrasts with the 77% of organizations who do encourage diversity in hiring with ratings of either excellent (34%) or good (43%) that together account for 48% of the overall sample (77% X 62%).

These findings are consistent with the progress shown in **FIGURE 22** and **FIGURE 21** and together indicate that diversity practices are making progress. But diversity is still an issue in IT, where 50% of our sample was drawn from (**FIGURE 27**). Diversity is formally recognized by the majority of organizations (62%) and the good news

is that diversity continues to make strides and we are certainly beyond the diversity tipping point, and there is no going back. As organizations that embrace diversity from the C-suite down begin talking about best practices and driving more visibility of diversity, it will become increasingly difficult to be an organization without policy and activities that demonstrate a level of support for diversity.

About the 2021 The Linux Foundation DEI Study

This year, the Jobs Report chose not to include questions about whether or not professionals felt discriminated against due to their identity, nor did we ask specific questions related to gender, race, or disability.

Our reasoning for this was that in 2021, the Linux Foundation launched its first study on Diversity, Equity, and Inclusion (DEI), specifically dedicated to exploring these issues within the open source community. The general conclusion of that study was that discrimination against groups was not a dominant factor, but feelings of inclusion differ widely between underrepresented groups. Enterprise Digital Transformation, Techlash, Political Polarization, Social Media Ecosystem, and Content Moderation are all cited as trends that have exposed and amplified exclusionary narratives and designs, mandating increased awareness and recalibrating individual and organizational attention. ■

KEY TAKEAWAY



Diversity in hiring and inclusivity practices have become more important within organizations, but more research is needed to understand the rate of diversity adoption and whether it is increasing.

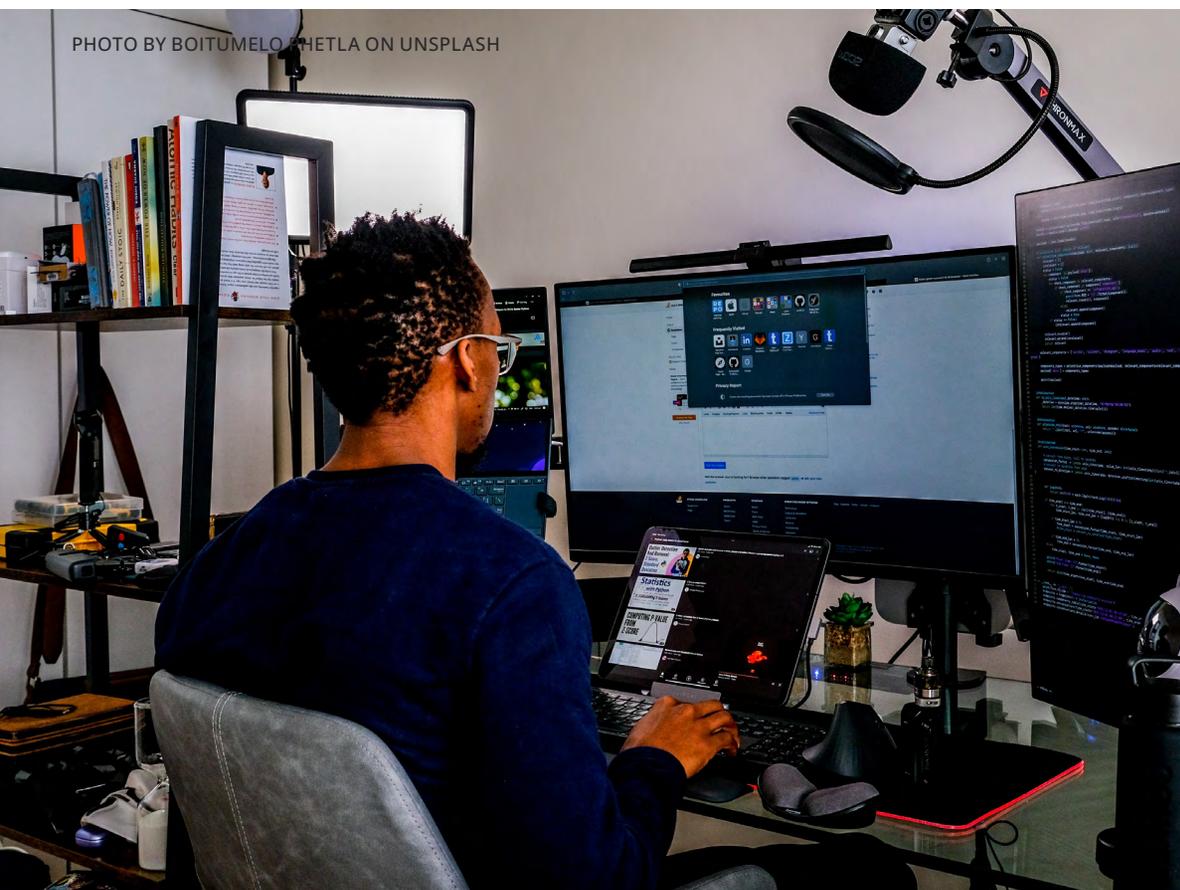


PHOTO BY BOITUMELO PHETLA ON UNSPLASH



Conclusions

The 10th Annual Jobs Report findings illustrate that we are well past the initial recovery process from the pandemic. Organizations now want to get down to the business of implementing the projects they may have been delaying due to resource constraints during the past three years. From a talent acquisition and development perspective, an “all of the above” approach is what’s needed.

OSPs with certified skills in cloud, containers, and orchestration systems, especially DevOps practices, are highly sought after. Not far behind in demand are cybersecurity and artificial intelligence/machine learning professionals as organizations look to bolster their security hardening efforts and find ways to better operationalize their data.

The findings imply that businesses must be more attentive to staff training and certification requests to remain talent competitive as rivals make training, hiring, and retention top priority. However, organizations should not overlook financial compensation because it’s evident that even satisfied employees aren’t opposed to the prospect of finding another for more money and better work/life balance.

Hiring managers find talented OSPs are in even greater demand than in previous years. Closing the talent and skills gap requires top-level recruitment incentives as well as aggressive upskilling and certification of existing talent, which will have the added impact of supporting retention efforts.

Finally, make sure your company has the necessary racial and gender diversity to remain competitive in today’s market. When it comes to organizational and ecosystem-wide diversity, implementing innovative hiring practices and ensuring your workplaces are inclusive positive environments for every individual, regardless of personal characteristics is essential. Making good on this goal entails actively recruiting underrepresented individuals and making an effort to ensure these groups follow through and apply to positions in your organization.

Methodology

This report provides comprehensive findings of the perspectives and needs of OSPs and hiring managers of these open source professionals. This report is based on data collected from the 10th Annual Open Source Jobs Survey. The survey for this research was developed in February 2022 and fielded as a web survey in March 2022 by the Linux Foundation and edX. Respondents were individuals who self-identified as an open source professional (one who uses or contributes to open source technologies) or one who hires or sources open source professionals. Screening criteria ensured that respondents had the following attributes:

- Self identifies as an OSP or OSP-hiring manager
- Employed (part-time or full time) or looking for work
- Self identifies as a real person

The survey included five sections:

- Screening questions. 7 Questions, Q1-Q7.
- Demographics. 7 questions, Q8-Q14.
- Questions for open source professionals. 39 Questions, Q15-Q53.
- Questions for hiring managers of open source professionals. 28 Questions, Q54-Q81.

- Final questions on diversity and how to improve the survey. 6 Questions, Q82-Q87.

A total of 1,940 respondents started the open source professional questions, and 1,672 respondents completed the section. The long nature of the survey accounts for the 268 respondents who partially completed section three.

A total of 559 respondents started and completed the hiring manager questions in section four. Over 1,200 respondents (open source professionals and hiring managers) completed the diversity, equity, and inclusion questions at the end of the survey.

All of the Figures shown in this report are from the Linux Foundation's 10th Annual Open Source Jobs Survey except where prior years are specifically identified.

Percentage values may not add exactly to 100% due to rounding.

How Missing Data is Handled

Although respondents are required to answer nearly all questions in the survey, there are times when a respondent is unable to answer a question because it is outside the

scope of their role or experience. For this reason, we frequently add a "Don't know or not sure" (DKNS) response to the list of responses for a question. We accept that not every respondent will know the answer to every question that we ask. However, this creates a conundrum regarding what to do with DKNS responses.

One approach to dealing with a DKNS is to treat it just like any other response to the question being asked. In this way, report readers can see the percent of respondents that answered DKNS. This advantage of this approach is that it reports back the exact distribution of the data collected. The challenge with this approach is that it distorts the distribution of valid responses — those responses where respondents were able to answer the question.

An approach that we have used in this report is one that excludes DKNS data from the analysis. This can be done because the data missing either can be classified as missing at random (MAR) or missing completely at random (MCAR). The definition of both of these classifications share a characteristic that the missing data is randomly distributed either completely or within a sub-sample. Excluding DKNS data from a question does not change the

distribution of data (counts) for the other responses, but it does change the size of the denominator used to calculate the percent of responses across the remaining responses. This has the effect of proportionally increasing the percent values of the remaining responses relative to the number of DKNS responses.

This approach does not infer anything from the DKNS. Instead, it simply excludes DKNS data from the analysis and the number of valid cases is adjusted accordingly. Where we have elected to exclude DKNS data, a careful examination of the footnote for the figure will enable the reader to determine the number of DKNS responses based on the difference between the sample size (DKNS inclusive) and valid cases (DKNS excluded).

We also only use this approach when responses to a question are generally mutually exclusive and collectively exhaustive. This avoids situations where the respondent answers DKNS because they don't see one or more responses that they would otherwise have selected and were not provided with a way to say "none of the above" or "other."

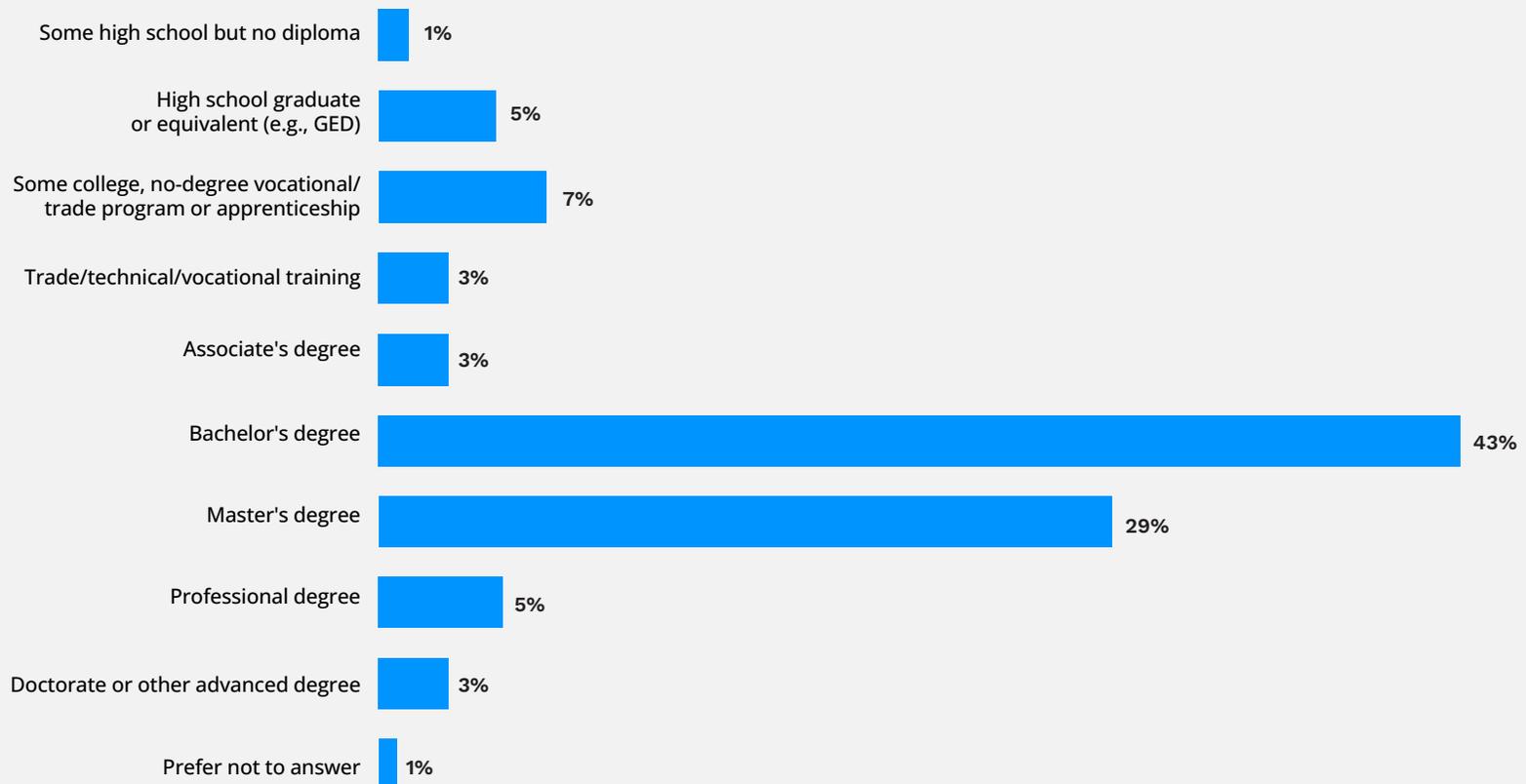
Survey Demographics

Selected demographics from the 10th Annual Jobs Survey are presented below.

FIGURE 24

HIGHEST LEVEL OF EDUCATION ACHIEVED

What is the highest degree or level of school you have completed? (Select one)

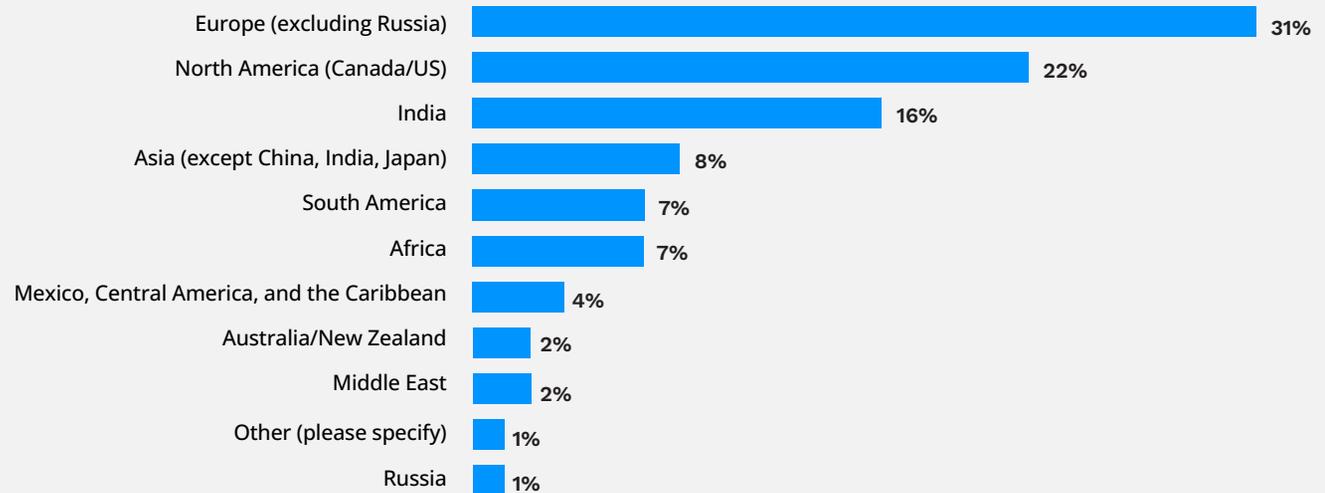


Q8, OPEN SOURCE PROFESSIONALS AND HIRING MANAGERS, SAMPLE SIZE = 2,063

SURVEY DEMOGRAPHICS

FIGURE 25
GEOGRAPHIC REGION
WHERE RESPONDENT LIVES

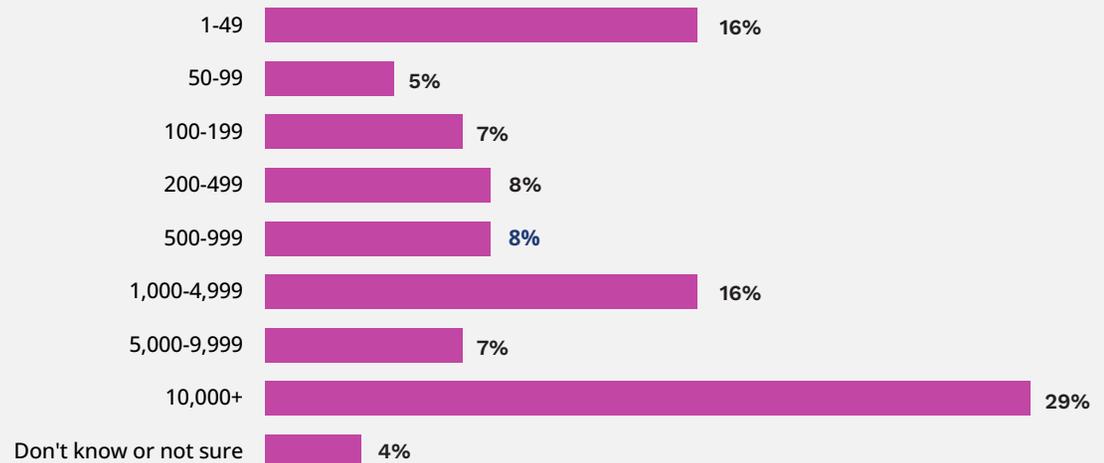
What region/country do you live in? (Select one)



Q9, OPEN SOURCE PROFESSIONALS AND HIRING MANAGERS, SAMPLE SIZE = 2,063

FIGURE 26
NUMBER OF EMPLOYEES IN
ORGANIZATION

Please estimate how many employees the organization you work for has worldwide? (Select one)

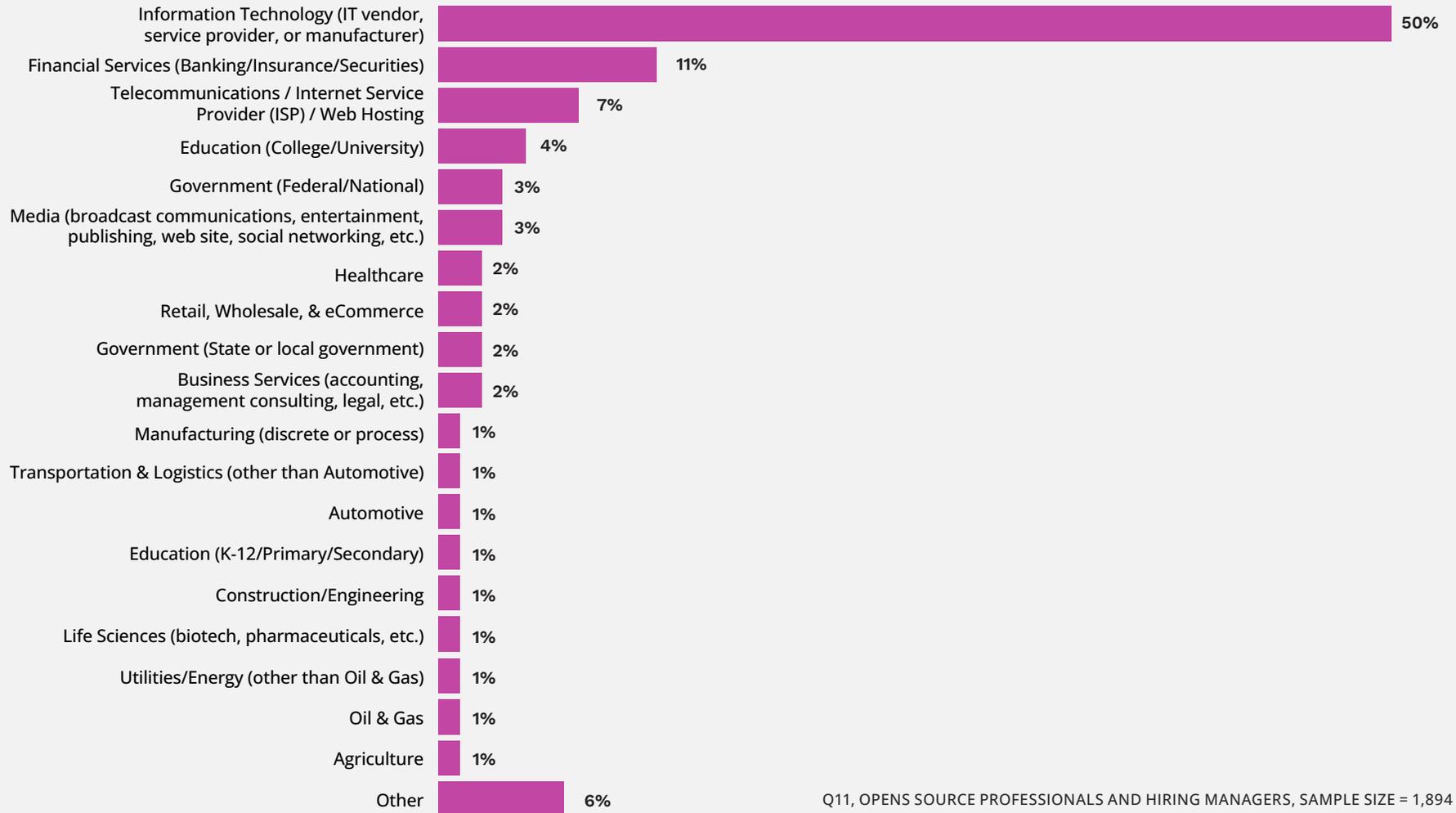


Q10, OPENS SOURCE PROFESSIONALS AND HIRING MANAGERS, SAMPLE SIZE = 1,894

FIGURE 27

INDUSTRY OF ORGANIZATION

Which of the following best describes the industry your employer is in? (Select one)



Q11, OPENS SOURCE PROFESSIONALS AND HIRING MANAGERS, SAMPLE SIZE = 1,894

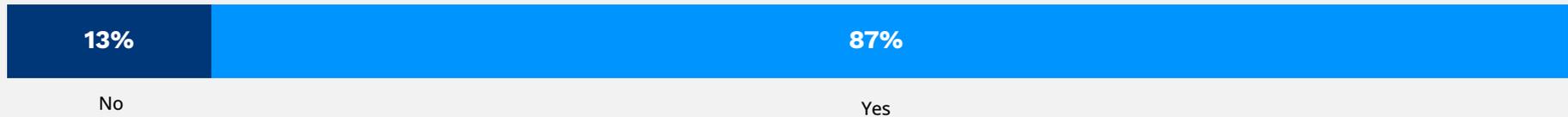
Appendix

A key objective in the development of this report was to present comprehensive data on the state of open source software jobs based on this 10th annual survey with comparisons to data from earlier reports where possible. This Appendix includes questions from this 2022 survey that explain the derivation of statements made and referenced in this report.

FIGURE A1

THE PRIORITY OF HIRING OPEN SOURCE PROFESSIONALS IN 2022

In 2022, is hiring open source talent a priority for you? (Select one)

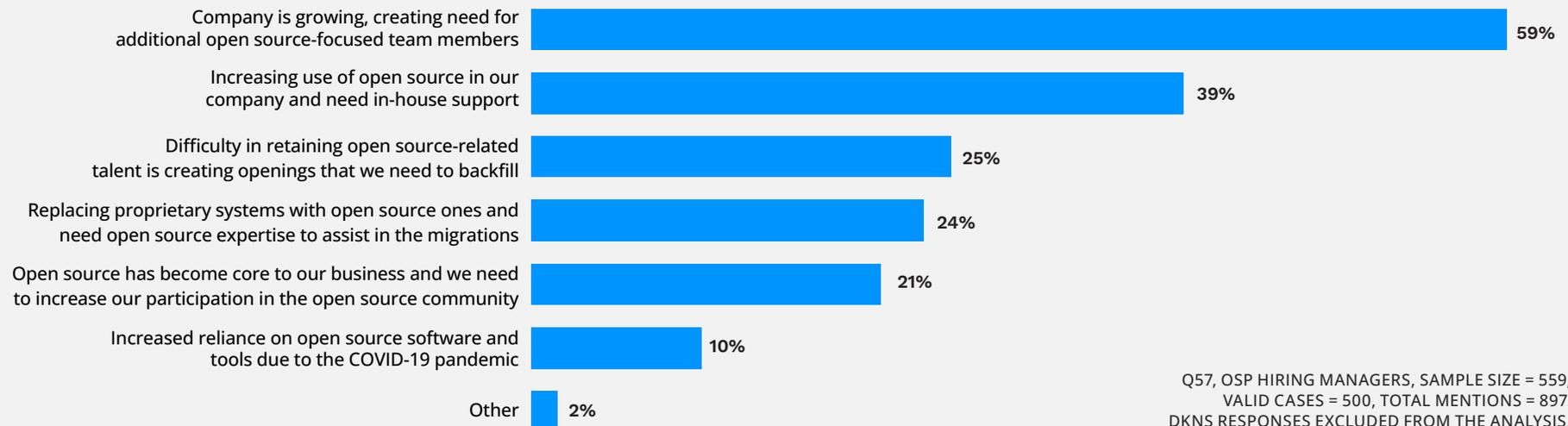


Q60, OSP HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 421. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A2

WHY ORGANIZATIONS ARE HIRING OPEN SOURCE PROFESSIONALS

What has changed at your or your clients' organization(s) that is driving the hiring of open source professionals in 2022, as compared to 2021? (Select all that apply)



Q57, OSP HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 500, TOTAL MENTIONS = 897. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A3

THE DIFFICULTY IN FINDING PROFESSIONALS WITH OPEN SOURCE SKILLS

How difficult has it been to find professionals with open source-related skills? (Select one)

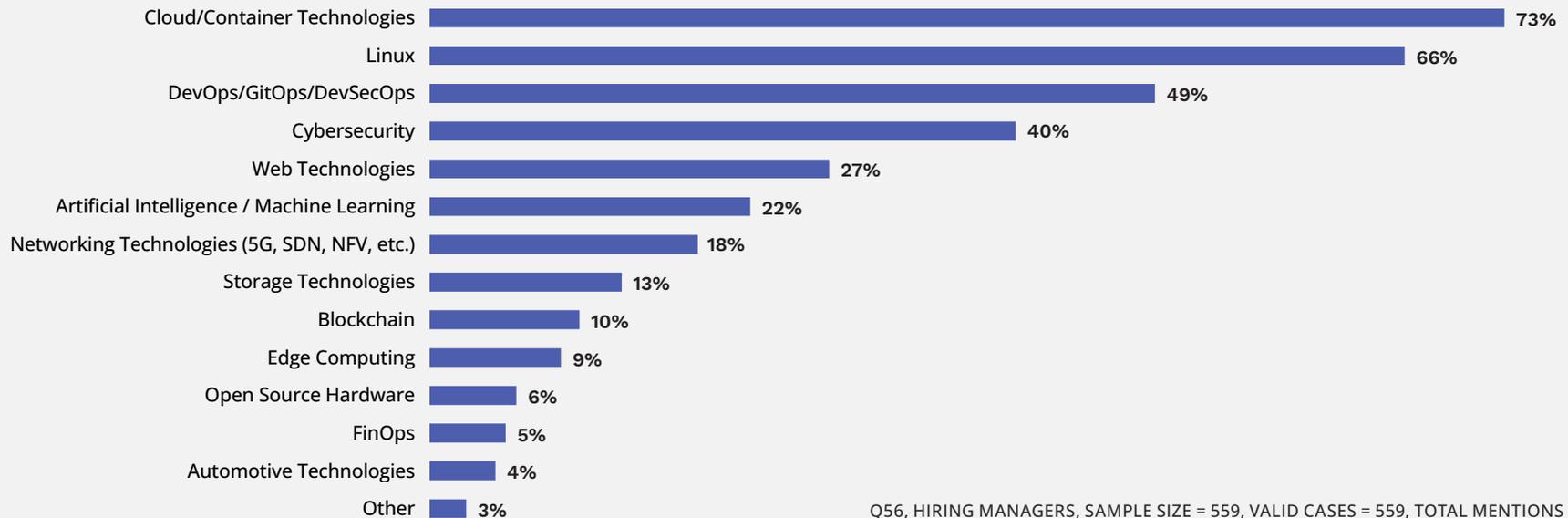


Q75, OSP HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 494. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A4

HOW HIRING MANAGERS PRIORITIZE OPEN SOURCE EXPERIENCE

When hiring or promoting open source professionals, experience with what knowledge areas impact your decision? (Select all that apply)

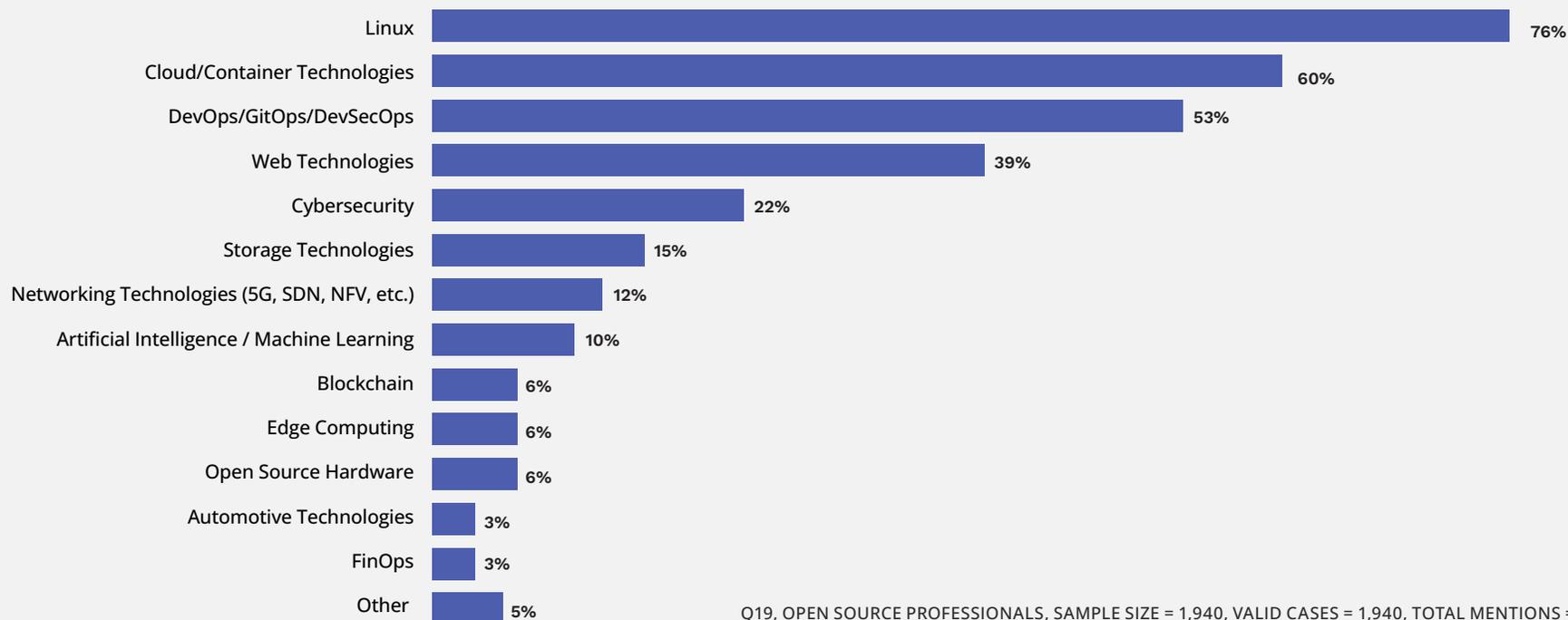


Q56, HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 559, TOTAL MENTIONS = 1,936

FIGURE A5

WHAT OPEN SOURCE PROJECTS OPEN SOURCE PROFESSIONALS WORK ON

What open source initiatives/projects do you work with? (Select all that apply)

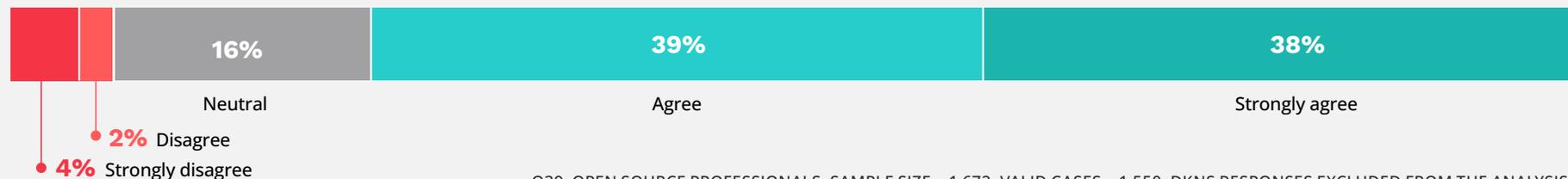


Q19, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,940, VALID CASES = 1,940, TOTAL MENTIONS = 6,096

FIGURE A6

THE UTILITY OF CYBERSECURITY TRAINING COURSES

Would cybersecurity training and courses be useful to the company you work for? (Select one)



Q39, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,672, VALID CASES = 1,550. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A7

HOW EASY IS IT FOR OPEN SOURCE PROFESSIONALS TO FIND NEW POSITIONS?

Even if you were not looking, how easy do you anticipate it will be to find a favorable new position in your area of specialty in 2022? (Select one)

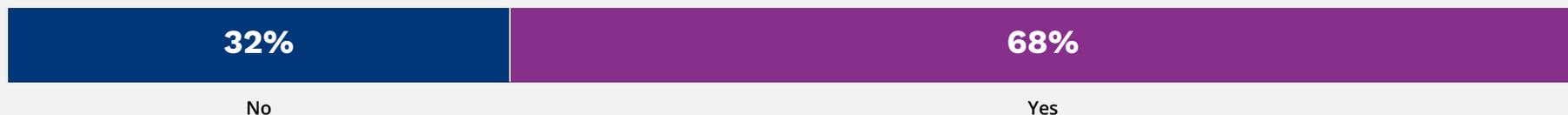


Q26, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,548, VALID CASES = 1,322. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A8

ARE OPEN SOURCE PROFESSIONALS WILLING TO MOVE TO A NEW EMPLOYER?

Would you consider moving to a new employer in 2022? (Select one)

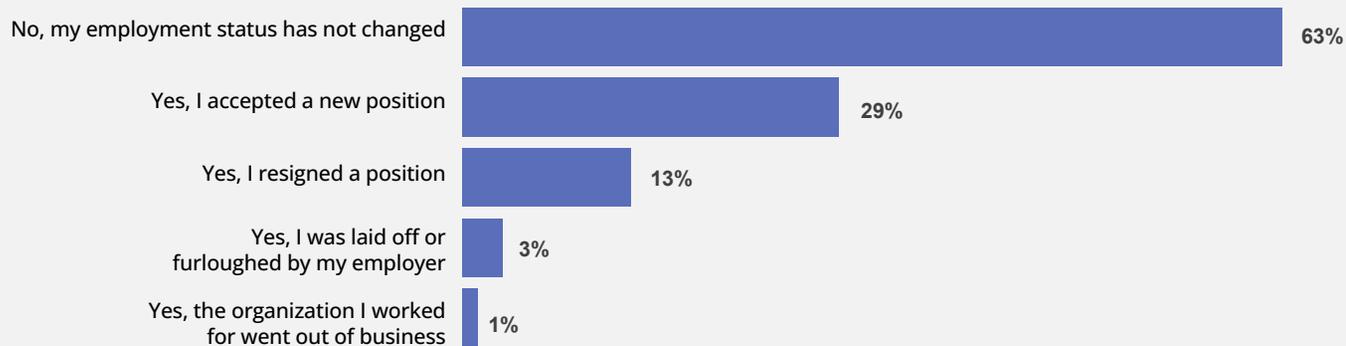


Q27, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,548, VALID CASES = 1,127. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A9

EMPLOYMENT STATUS CHANGES

Has your employment status changed in the last 12 months? (Select all that apply)



Q45, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,672, VALID CASES = 1,672, TOTAL MENTIONS = 1,834

FIGURE A10

VOLUNTARY CHANGE OF POSITION IN 2022

Did you Resign or Accept a position in 2022?

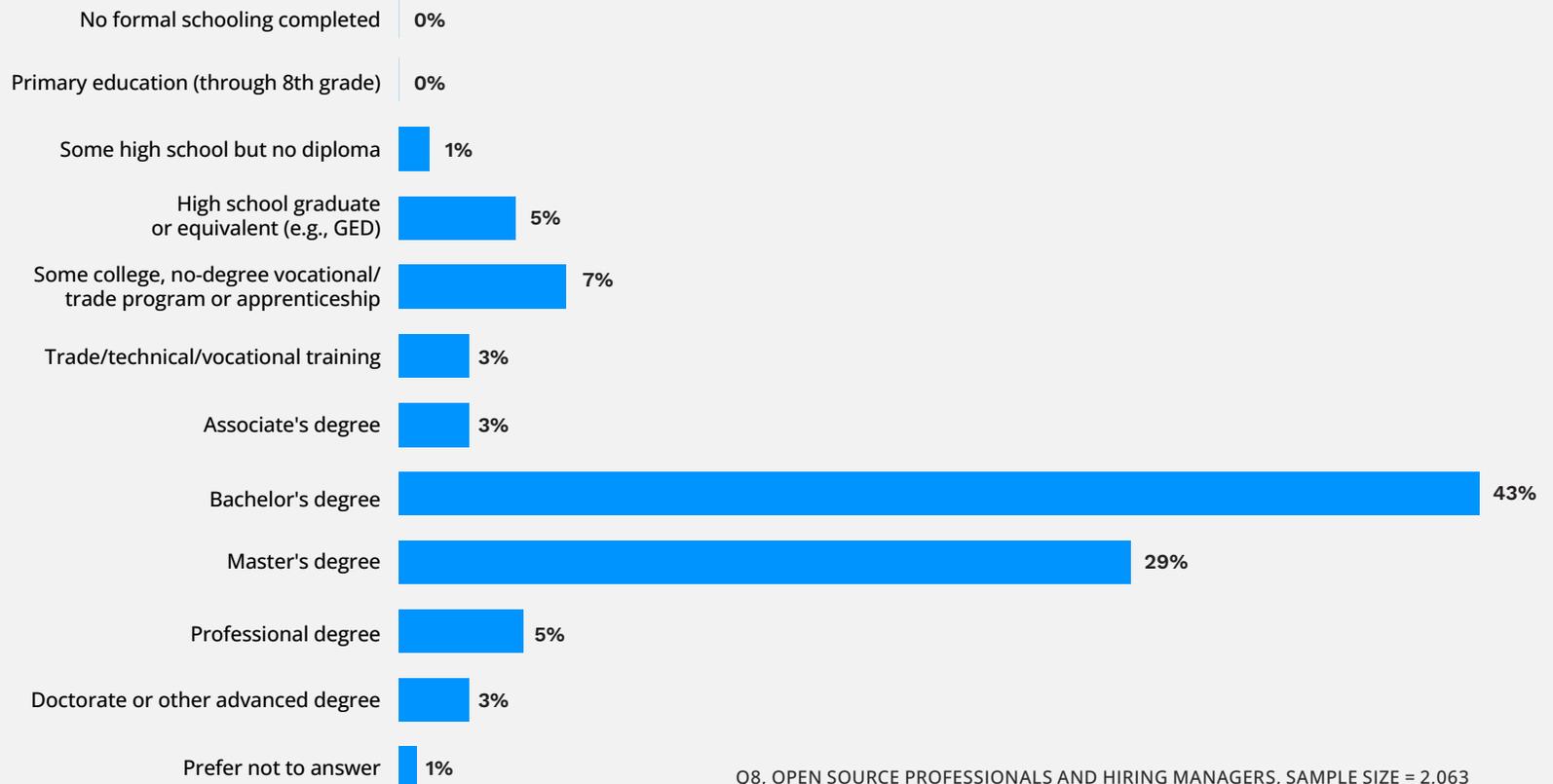


Q45A, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,672

FIGURE A11

HIGHEST EDUCATIONAL DEGREE COMPLETED

What is the highest degree or level of school you have completed? (Select one)



Q8, OPEN SOURCE PROFESSIONALS AND HIRING MANAGERS, SAMPLE SIZE = 2,063

FIGURE A12

IMPORTANCE OF COLLEGE/UNIVERSITY DEGREE

How important is it that candidates for open source positions have a college/university degree? (Select one)

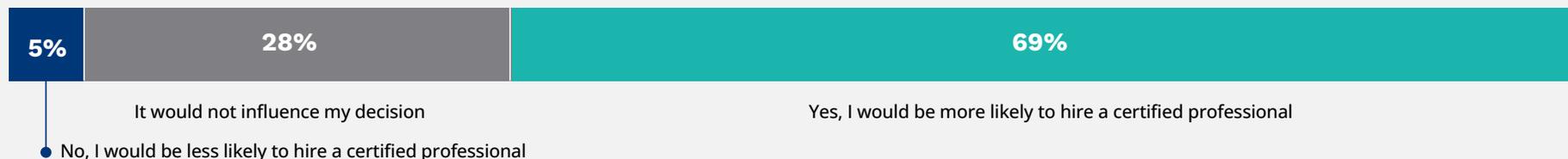


Q64, HIRING MANAGERS, SAMPLE SIZE = 559

FIGURE A13

IMPACT OF OPEN SOURCE CERTIFICATIONS ON HIRING DECISIONS

Are your hiring decisions for open source positions influenced by whether a candidate holds a certification? (Select one)

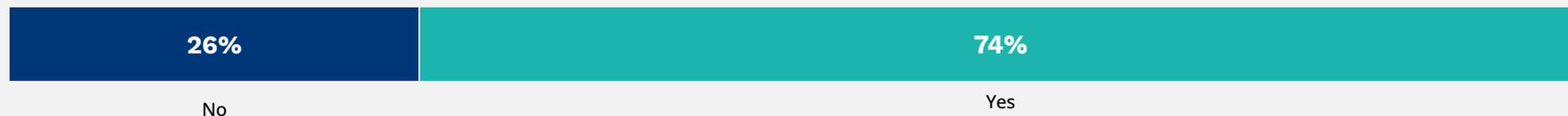


Q62, HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 488. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A14

EMPLOYEE REQUESTS FOR OPEN SOURCE TRAINING

Have you noticed an increase in existing employees requesting or proactively taking open source training in the past year? (Select one)



Q59, HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 425. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A15

IMPORTANCE OF VENDOR NEUTRALITY IN TRAINING PROVIDER

How important is vendor neutrality in your training provider? (Select one)



FIGURE A16

IMPORTANCE EMPLOYEES ATTACH TO CERTIFICATIONS

How useful do you think certifications are for your career? (Select one)

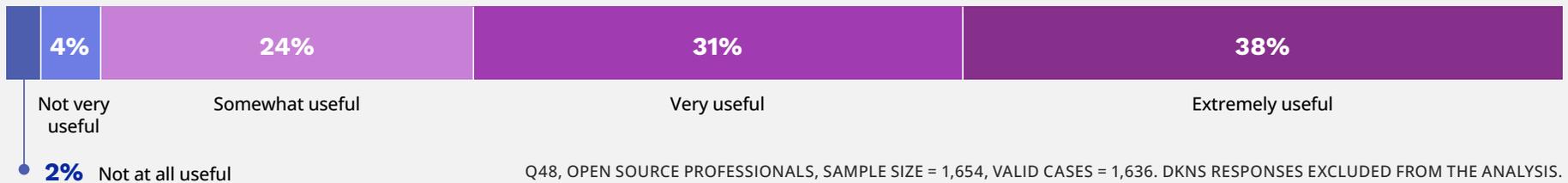
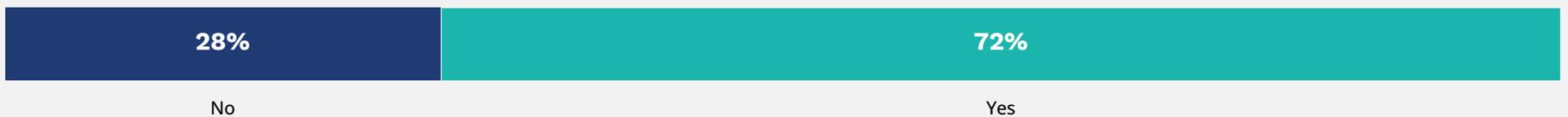


FIGURE A17

THE IMPORTANCE OF HIRING CERTIFIED OPEN SOURCE PROFESSIONALS

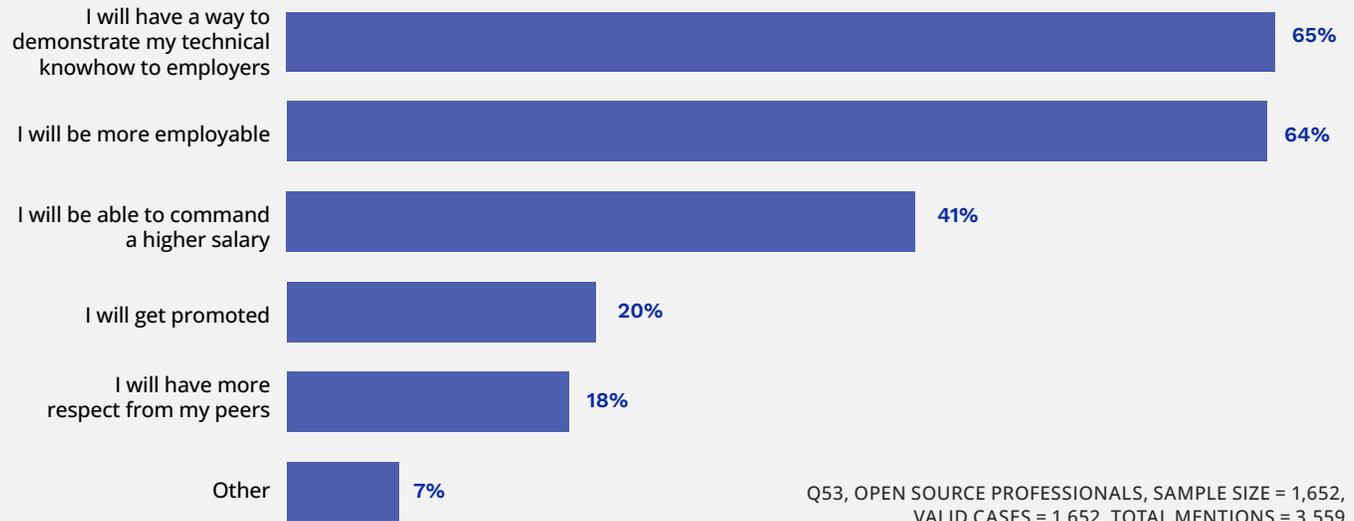
In 2022, is hiring certified open source professionals a priority for you? (Select one)



Q61, HIRING MANAGERS, SAMPLE SIZE = 559, VALID CASES = 415. DKNS RESPONSES EXCLUDED FROM THE ANALYSIS.

FIGURE A18
BENEFITS FROM BECOMING CERTIFIED

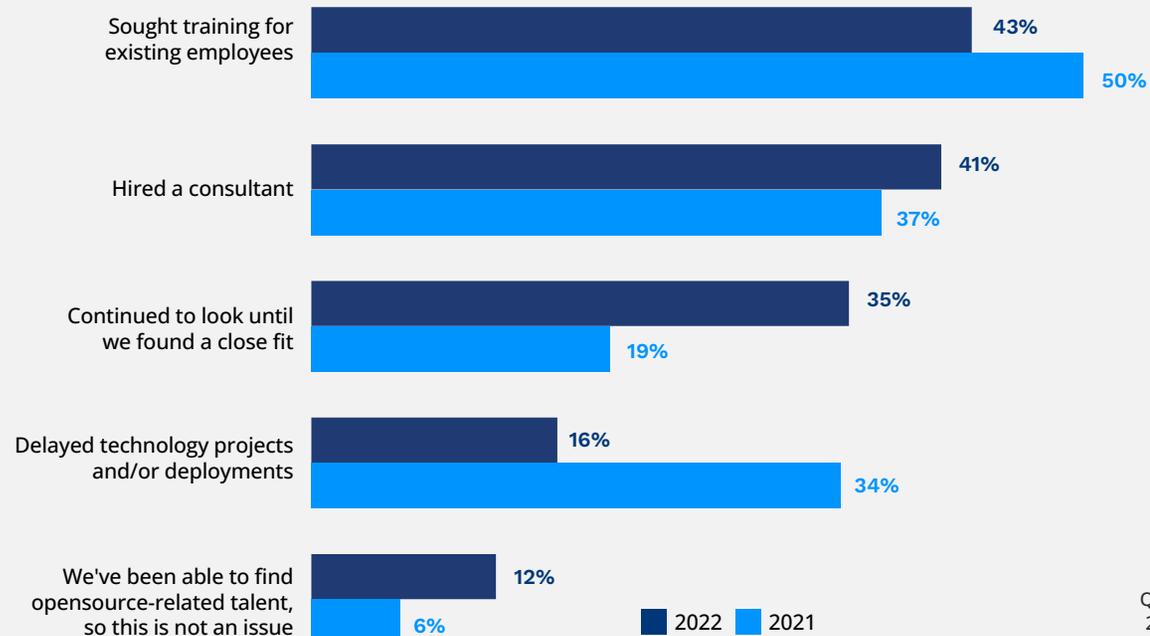
What do you see as the biggest benefits of becoming certified? (Select all that apply)



Q53, OPEN SOURCE PROFESSIONALS, SAMPLE SIZE = 1,652, VALID CASES = 1,652, TOTAL MENTIONS = 3,559

FIGURE A19
HOW ORGANIZATIONS COPE WHEN FINDING OPEN SOURCE PROFESSIONALS IS DIFFICULT

If unable to find professionals with the open source-related skills you need, which of the following best describe how you have met your organization's requirements? (Select all that apply)

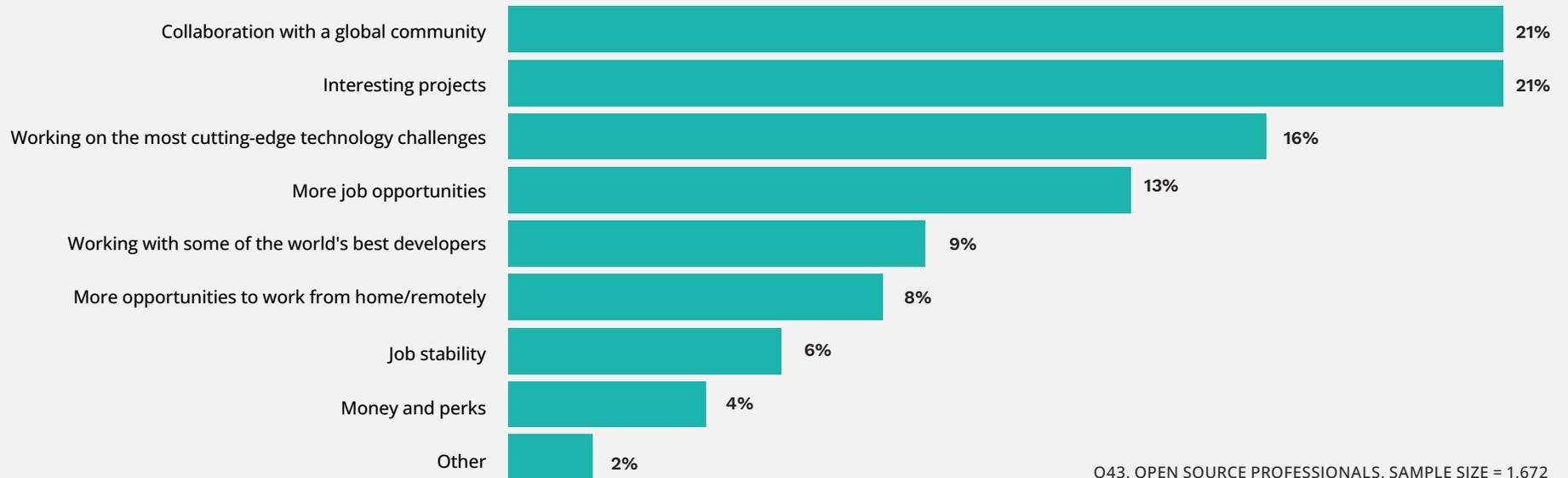


Q78, HIRING MANAGERS, 2022 SAMPLE SIZE = 559, SAMPLE SIZE 2021 = 380

FIGURE A20

THE BEST ATTRIBUTES OF BEING AN OPEN SOURCE PROFESSIONAL

What is the best thing about being an open source professional? (Select one)



Acknowledgments

We thank all of the people who participated in the survey and interview process, as well as those who dedicate time and effort toward building inclusive communities in open source. Special thanks to the Linux Foundation colleagues for their involvement in the various stages of the research process: Dan Brown, Hilary Carter, Michael Dolan, Lawrence Hecht, Stephen Hendrick, Jason Perlow, Melissa Schmidt, Clyde Seepersad, Mary Simpkins, and Derek Weeks, and to Henry Kesner, Carolyn Tiernan and Ana Tobin from edX, for their continued support.

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