



Research



World of
Open Source

2024 Japan Spotlight Insights Report

Open Source Trends, Challenges,
and Opportunities in Japan

Adrienn Lawson, *The Linux Foundation*

Foreword by

Noriaki Fukuyasu, *The Linux Foundation*

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2024 Japan Spotlight Insights Report

AI/ML (28%), **AR/VR** (24%), & **cybersecurity** (24%) are the **top trending** open source technologies in Japan.



One-third of respondents plan to **prioritize open source alternatives to tech monopolies** in their future open source investments.

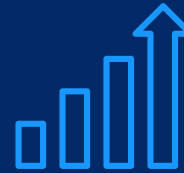


72% of respondents believe **OSS is more secure than closed software**, and 82% believe the open source development model is better than the closed approach.



70% of respondents say OSS is **valuable to their organization**, which is **lower than the global average** of 93%.

76% of respondents report an **increase in business value** from using OSS this year.



In the technology & telecommunications industry, OSS **reduces development costs and improves interoperability** for cloud & containers (64%), AI (48%), & operating systems (45%).

The manufacturing and industrial sectors **benefit from OSS through improved standards and collaboration**, especially in AI, data management, & DevOps (29% each).



Financial and business services focus on collaboration and cost reduction, especially when it comes to cybersecurity (33%), operating systems (33%), & AI (25%).



Healthcare use of OSS manages risks & enhances collaboration, particularly in deployments of AI, blockchain, & security technologies (31% each).



27% of organizations **contribute to open source projects**, compared to a global average of 42%.



Lack of time (49%), **unclear project guidelines** (47%), & **communication barriers** (37%) are the main challenges to contributing to open source.



Open source contributors in our sample get their primary **funding from project-related services** (34%), **employer support** (32%), & **government grants** (24%).



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Foreword

The Linux Foundation has become a trusted space for open source software (OSS) development, expertly managing hundreds of projects through a commitment to open collaboration and governance. As the head of Japan operations, I have worked for many years with OSS champions to guide the industry forward, participating in initiatives to raise awareness and providing extensive support to Japanese companies as they engage with the global OSS community.

The findings from this year's report highlight the crucial role OSS plays in Japan's business landscape. More than two-thirds of survey respondents recognize OSS as valuable to their organizations, and three-quarters report increased business value from OSS this year. Japanese companies are not only leveraging OSS to enhance their operations but are also contributing to global OSS development. This vibrant ecosystem has benefited significantly from the steadfast support and passion of many great leaders in this industry that I had the privilege to assist. These leaders have been instrumental in nurturing the Japanese OSS landscape, allowing homegrown initiatives to flourish on a global scale. I am endlessly thankful to those who have built the foundation of the Japanese open source industry today.

As we look to the future, it's clear that while the potential for OSS is immense, Japan lags in its understanding of this potential compared to other regions. Only one quarter of Japanese organizations currently contribute to open source projects. Addressing barriers such as a lack of time and communication challenges will be essential for enhancing participation and maximizing the benefits of OSS.

The 2023 Linux Foundation Research survey on open source trends further enriched our understanding of OSS participation in Japan. This report marks the continuation of our exploration into regional open source engagement, following our previous reports on Europe and global insights. I am thrilled to present the 2024 Japan Spotlight report, and I extend my heartfelt thanks to Linux Foundation Research and all survey participants for their contributions. Together, we can continue to support and promote open source innovation across Japan and beyond.

NORIAKI FUKUYASU

Vice President of Japan Operations,
The Linux Foundation



Introduction

The 2024 Japan Spotlight Insights Report delivers a focused analysis of how open source software (OSS) is transforming key industries across Japan. With the rapid shift towards digital transformation, Japanese companies are leveraging OSS to drive innovation, cut development costs, and improve interoperability. This report, based on the 2024 World of Open Source Survey conducted between March and May of 2024, showcases the critical role of OSS in addressing both industry-specific challenges and broader national priorities, such as cybersecurity and technological resilience.

Industries like automotive, healthcare, financial services, and manufacturing are increasingly recognizing the strategic value of OSS. From enhancing collaboration to reducing dependency on proprietary solutions, OSS is now an essential and cost-effective way to maintain competitiveness in global markets. The report also presents the role of individual contributors in Japan, who are motivated by the potential for personal growth, yet face barriers due to lack of time and find difficulty understanding project guidelines and contribution processes. Funding, both from employers and government initiatives, is becoming critical to sustaining the Japanese (and worldwide) open source ecosystem.

While Japan demonstrates significant progress in open source adoption, global comparisons reveal gaps in perception and strategic value. For instance, 82% of Japanese surveyed companies used OSS in 2023, yet only 70% recognize its value, compared to a global average of 93%. Augmented and virtual reality open source technologies are prioritized by 24% of Japanese respondents, a sharp contrast to just 4% globally, reflecting Japan's unique leadership in gaming, robotics, and industrial simulations. However, when it comes to security, Japan lags behind global confidence levels. While 72% of Japanese organizations believe open source software is more secure than proprietary alternatives, the global average is higher at 86%.

This report provides insight into the world of open source in Japan, offering a closer look at the areas where OSS is gaining traction and the challenges that remain. It aims to help organizations navigate these developments and make informed decisions about their future engagement with open source technologies. While Japan shows significant progress, global comparisons highlight areas where it lags behind, signaling a need for further alignment with global best practices to maximize the benefits of open source adoption.



Regional priorities in Japan

INDUSTRIES TO INVEST IN OPEN SOURCE

The IT sector came first in both years as the top industry to benefit from OSS. The automotive industry, a cornerstone of Japan's economy, was identified as the second key area for open source investment, up from its sixth place last year (Table 1).

TABLE 1
Which industries do you think would most benefit from investing in open source?

	2024	2023
Information technology (IT vendor, service provider, or manufacturer)	1.	1.
Automotive	2.	6.
Telecommunications / Internet service provider (ISP) / web hosting	3.	4.
Healthcare	4.	5.
Business services (accounting, management consulting, legal, etc.)	5.	2.

2024 World of Open Source Survey (Japan), Q15, Sample Size = 106, Valid Cases = 106, Total Mentions = 261

AREAS FOR FURTHER INVESTMENT

In which areas do you think there should be further investment in open source across your geographic region?

35%

Open source alternatives to technology monopolies

Respondents emphasized that open source is key to reducing dependency on dominant tech companies, resulting in a more competitive and innovative marketplace.

31%

Better funding for the commercial open source start-up ecosystem

Respondents highlighted the need for increased funding to support open source startups, suggesting that financial resources are critical for the growth and success of these initiatives.

27%

Government adoption of open source

Respondents indicated that there is value in increasing government adoption of open source solutions, potentially to increase transparency, reduce costs, or improve the public sector technology infrastructure.

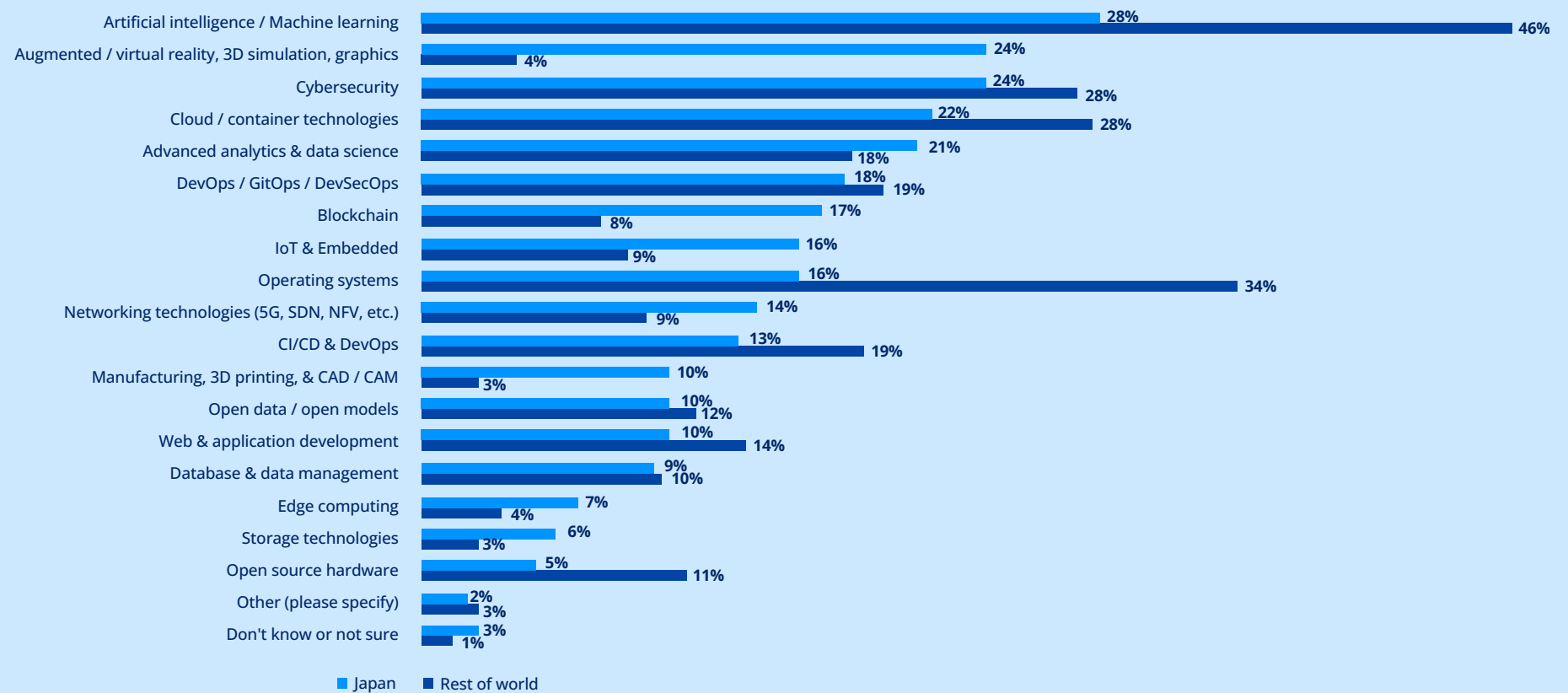
2024 World of Open Source Survey (Japan), Q16, Sample Size = 106, Valid Cases = 106, Total Mentions = 257

TECHNOLOGIES TO OPEN SOURCE

AI / ML lead in importance for open source, with 28% of respondents from Japan and 46% globally citing them as critical, reflecting the global focus on automation. Japan also prioritizes augmented and virtual reality (24% vs. 4% globally), driven by its unique leadership in gaming, robotics, and industrial simulations. Cybersecurity, a universal priority, is recognized by 24% in Japan and 28% globally.

FIGURE 1

Which technologies do you believe would benefit the most from being open source?



2024 World of Open Source Survey, Q14 by Q7, Sample Size = 1,065, Valid Cases = 1,065, Total Mentions = 3,001

OSS security in Japan

AN OPEN OR CLOSED APPROACH FOR SECURITY?

72% of respondents believe that OSS is more secure than closed software

This belief is supported by Japan's proactive stance in standardizing security practices across the software supply chain, with initiatives such as the adoption of Software Bill of Materials (SBOM) playing a key role in transparency and security.^{1,2} However, Japan's confidence in OSS security is somewhat lower than the global average, where 86% of respondents share this view.

82% of respondents believe that the open approach leads to better software quality compared to the closed approach

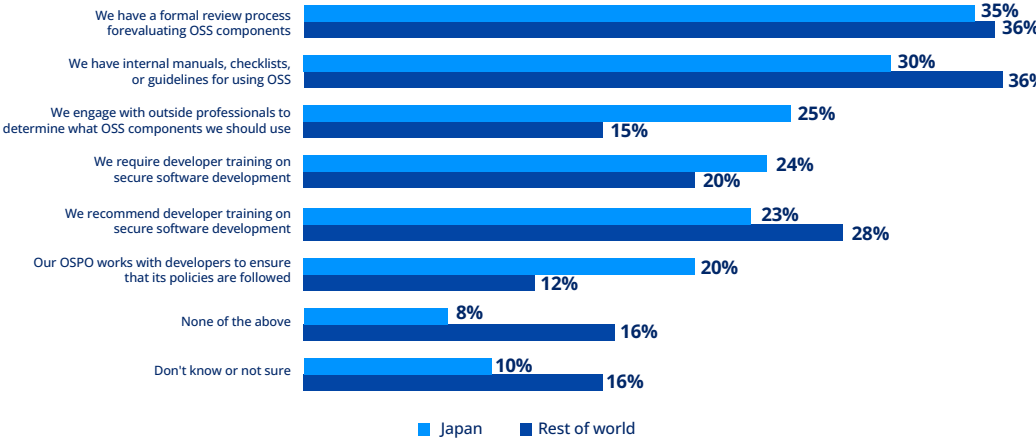
In Japan, there is a strong belief that OSS helps meet specific local challenges, such as scalability and cybersecurity. Globally, however, 92% of respondents share this view, showing Japan's perspective is slightly lower than the global average, but still highly aligned with the benefits of open source.

2024 World of Open Source Survey (Japan), Q19, Sample Size = 83 (DKNS excluded)
 2024 World of Open Source Survey (Japan), Q20, Sample Size = 77 (DKNS excluded)

SECURITY PRACTICES

To strengthen OSS security, Japanese organizations are increasingly adopting formal review processes and internal guidelines as shown in Figure 2. For instance, 35% have implemented review processes for evaluating OSS components, ensuring that software meets stringent security and functionality standards. This is complemented by the efforts of 30% of organizations that have developed internal manuals and checklists to govern OSS use. These practices are part of a broader, industry-wide focus on security, as emphasized by Japanese IT leaders during the Open Source Security Summit Japan 2022.¹ The collective aim is to build a resilient and secure software ecosystem that can withstand the growing threats posed by cyber vulnerabilities. Overall, Japan's approach mirrors global trends, but with slightly lower adoption in some areas, such as secure software development training (20% in Japan vs. 24% globally).

FIGURE 2
 What practices does your organization follow regarding the use of OSS?



2024 World of Open Source Survey, Q27 by Q7, Sample Size = 1,047, Valid Cases = 1,047, Total Mentions = 1,875

1. <https://openssf.org/press-release/2022/08/22/the-linux-foundation-and-open-source-software-security-foundation-openssf-gather-japanese-industry-and-government-leaders-for-open-source-software-security-summit-japan/>
 2. <https://openssf.org/blog/2022/08/24/outcomes-from-open-source-software-security-summit-in-japan/>

Value of OSS in Japan

In Japan, where 82% of companies surveyed have adopted OSS,¹ the perception of its value remains significantly lower than the global average of 93%. While Japanese IT leaders recognize OSS as a key driver for innovation, digital transformation, and competitive advantage, the country lags behind in fully appreciating its strategic importance. This shows a need for greater awareness and advocacy to align Japan's view of OSS value, particularly given its proven benefits in development, flexibility, and cost efficiency in a competitive market.

Category	Percentage
Global average	93%
Japan	70%

agree that OSS is valuable to the future of their organization

Globally, 94% of companies recognize the strategic value of OSS, a figure notably higher than in Japan. While Japan's technological sectors—such as automotive, manufacturing, and telecommunications—rely heavily on OSS for improving interoperability and driving innovation,² the country's perception of OSS's strategic importance lags behind.

Category	Percentage
Global average	94%
Japan	65%

agree that OSS is valuable to their industry

2024 World of Open Source Survey, Q21, Sample Size = 1,037 (DKNS excluded)
 2024 World of Open Source Survey, Q22, Sample Size = 1,043 (DKNS excluded)

1. <https://www.linuxfoundation.org/research/world-of-open-source-japan-2023>
 2. https://www.meti.go.jp/english/press/2024/0524_002.html

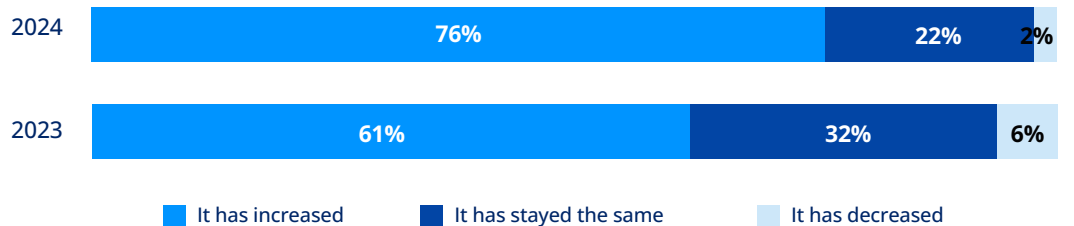
INCREASING VALUE FROM YEAR TO YEAR

Figure 3 shows that over the last year, 76% of respondents reported an increase in the business value derived from OSS usage, reflecting Japan's ongoing commitment to OSS-driven innovation. METI's [Mobility DX Strategy](#) particularly highlights how open source technologies contribute to the development of software-defined vehicles and smart infrastructure, allowing these industries to remain competitive globally.

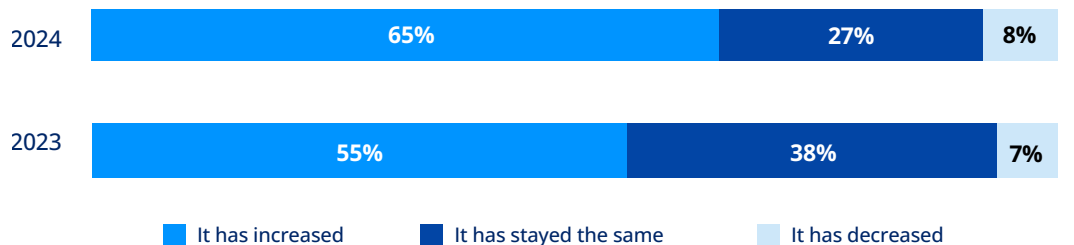
In addition, 65% of organizations noted an increase in the overall benefit they derive from OSS contributions. Japanese organizations are becoming more active in contributing to OSS projects, recognizing that giving back to the community not only strengthens their own capabilities but also helps to shape global standards.

FIGURE 3

Over the last year, how has the business value your organization derives from OSS use changed?



Over the last year, has the overall benefit your organization derives from OSS contributions changed?



2024 World of Open Source Survey (Japan), Q33, Sample Size = 95 (DKNS excluded)
 2023 World of Open Source Survey (Japan), Q20, Sample Size = 109 (DKNS excluded)

Industry analysis

The survey highlights how open source software (OSS) drives innovation across key industries by addressing sector-specific needs (Table 2 and Figure 4). In the technology and telecommunications industry, OSS helps reduce product development costs, improve interoperability, and increase transparency, with a focus on cloud / containers, AI, and operating systems. Manufacturing and industrial sectors benefit from OSS through enhanced industry standards and collaboration, with key areas such as, AI and data management, and DevOps. Financial and business services prioritize collaboration and cost reduction, focusing heavily on cybersecurity, operating systems and AI. Healthcare leverages OSS to manage risks and support collaboration, with significant use in AI, blockchain, and security.

TABLE 2

Which aspects of your industry do you think would most benefit from open source?
segmented by industry

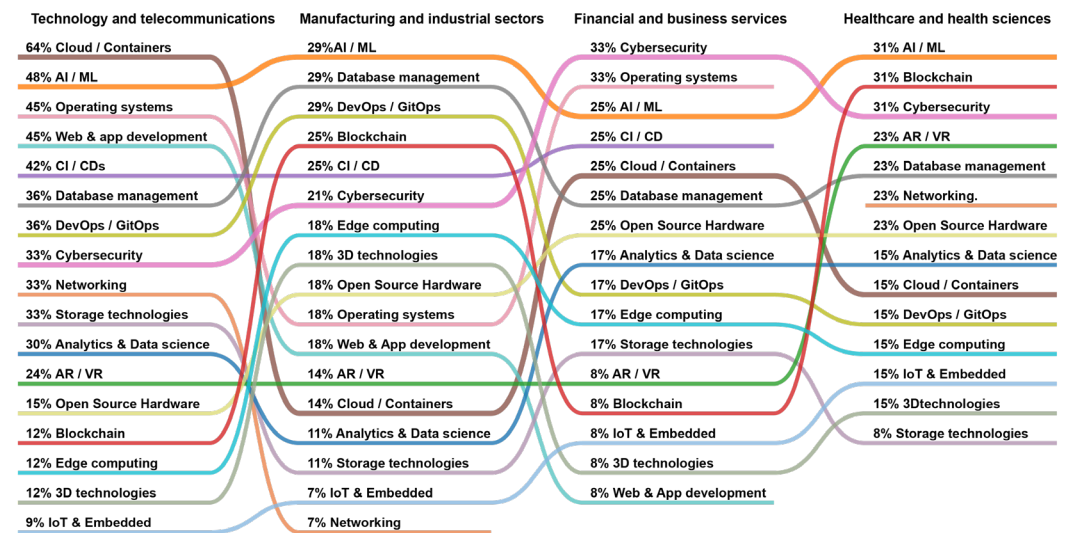
	Technology and telecommunications	Manufacturing and industrial sectors	Financial and business services	Healthcare and health sciences
1.	Reduced product development costs	Industry standards and interoperability	Collaboration	Risk management
2.	Industry standards and interoperability	Collaboration	Reduced operating costs	Collaboration
3.	Transparency	Data sharing	Productivity	Reduced product development costs

2024 World of Open source Survey (Japan), Q23 by Q11, Sample Size = 89, Valid Cases = 89, Total Mentions = 291

Each sector shows a clear alignment between OSS adoption and industry challenges. Manufacturing emphasizes interoperability for complex supply chains, while financial services focus on securing digital infrastructure. Technology sectors prioritize cost efficiency and standards, while healthcare seeks better risk mitigation. Across all industries, AI has taken up a central role, driving advancements in automation, data analysis, and decision-making.

FIGURE 4:

In which of the following areas does your organization use OSS?
segmented by industry



2024 World of Open Source Survey (Japan), Q29 by Q11, Sample Size = 86, Valid Cases = 86, Total Mentions = 338

OSS contributors in Japan

27% of organizations contribute code to open source projects from the Japan sample. The global average is significantly higher at 42%.

2024 World of Open Source Survey (Japan), Q37, Sample Size = 102

MOTIVATORS AND CHALLENGES

TABLE 3

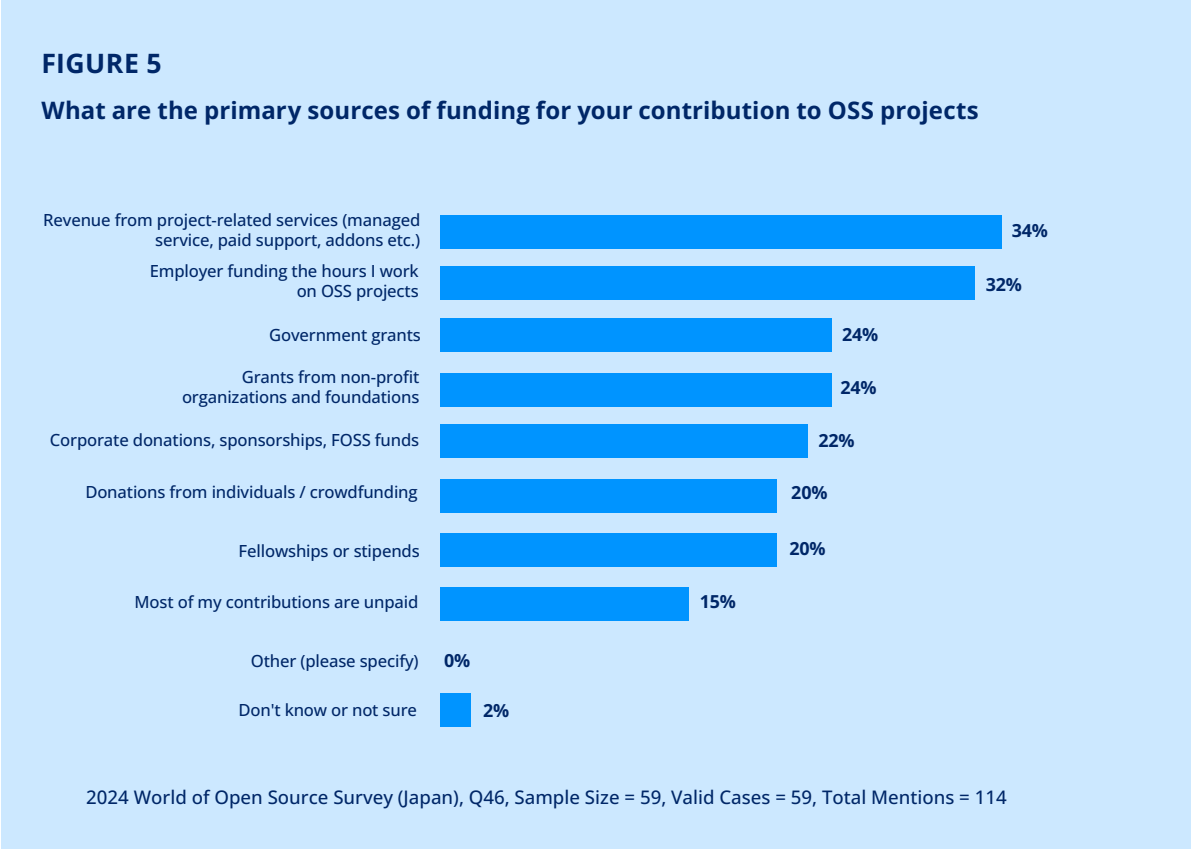
Top motivators		Top challenges	
87%	Learning and personal development	49%	Lack of time due to personal commitments
81%	Fulfilling a technology need not met elsewhere	47%	Difficulty understanding project guidelines and contribution processes
76%	Involvement in a project I find fascinating and / or use regularly	37%	Communication barriers, such as language differences

In Japan, contributors to open source projects are primarily motivated by opportunities for learning, addressing unmet technology needs, and engaging with projects they find personally interesting. However, they face significant challenges, including limited time due to personal commitments and difficulty navigating project guidelines. Additionally, most open source projects are in English, which can create language barriers for Japanese contributors and hinders their participation in international collaborations (Table 3).

2024 World of Open Source Survey (Japan), Q47, Sample Size = 59
 2024 World of Open Source Survey (Japan), Q48, Sample Size = 59, Valid Cases = 59, Total Mentions = 157

FUNDING

Japan’s open source contributors rely on a combination of self-funding and organizational support to sustain their work (Figure 5). The primary funding sources include revenue from project-related services, such as managed services, paid support, and add-ons, which help contributors monetize their contributions. Employer funding is another key source, with some companies in industries such as telecommunications and automotive supporting open source efforts. Additionally, government grants play an important role, especially in fields of cybersecurity, IoT, and digital transformation, where open source is critical. Non-profit organizations and foundations also provide important financial support.





Methodology

The 2024 World of Open Source: Global Spotlight Survey included 48 questions on the themes of open source use, contribution, value, and sustainability. For information about access to the 2024 World of Open Source: Global Spotlight project and survey instrument, see the Data.World access heading below.

Survey screening involved the use of four variables to validate the respondent. The respondent needed to answer all of the demographic questions.

- The respondent had to be at least somewhat familiar with the concept of OSS.
- The respondent needed to self-identify as a real person willing to share their OSS experience and perceptions.
- The respondent needed to be able to identify what perspective they can speak for.
- The respondent needed to be able to identify their employment status.

A total of 2,222 candidates started the global survey, 958 did not finish the survey or were disqualified due to our screening criteria, and 1,264 answered all questions of the survey. The margin of error for this sample size was $\pm 2.32\%$ at a 90% confidence level. Regarding the data filtered for Japan and included in this report, 106 Japanese respondents completed the survey. The margin of error for the

Japan data is $\pm 8.2\%$ at the 90% confidence level. The research team stratified data collection by company size and organization type. The stratification design allowed segmentation by these variables, and other variables correlated with these.

Although respondents had to answer nearly all questions in the survey, there were times when they were unable to answer a question because it was outside the scope of their role or experience. For this reason, we added a “Don’t know or not sure” (DKNS) response to the list of responses for nearly all questions. However, this creates a variety of analytical challenges.

Some of the analyses in this report exclude DKNS responses. This is because the data missing can be classified as either missing at random or missing completely at random. 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 percentage of responses across the remaining responses. This has the effect of proportionally increasing the percentage values of the remaining responses. Where we have elected to exclude DKNS data, the footnote for the figure includes the phrase “DKNS responses excluded”.

The percentage values in this report may not total exactly 100% due to rounding.

Survey demographics

The demographic data in Figure 6 illustrate the geographic distribution of the global survey. Respondents were asked to identify the region where their corporate headquarters is located (Q7). This question was used to filter the data to only include organizations from Japan in this Japan Spotlight report. 31% of the sample came from respondents working in European headquartered organizations, while another 30% came from organizations based in the United States or Canada. We focused efforts on gathering a sufficient sample from Japan to create a Japan Spotlight report from the survey results. We did receive input from other regions but at a lower rate.

The chart in Figure 7 shows the professional role of respondents and company size as measured by number of employees. The left-hand chart shows that approximately 51% of respondents were in IT roles. The right-hand chart shows that the size of the organizations surveyed ranges from microbusinesses with 1 to 10 employees to large organizations with more than 20,000 employees. The type of organization is shown in the left-hand chart of Figure 8. organizations where the primary

revenue comes from IT products and services composed 35% of the sample. This could include hardware and software vendors, system integrators, cloud service providers, etc. 63% of the sample included industry-specific end-user organizations. We also received surveys completed by respondents from academic, non-profit, or governmental organizations (2%). In the right-hand chart, respondents were able to report the industry their organizations are part of. Most respondents work for cross-industry IT vendors (22%), but a variety of industries are represented in the sample.

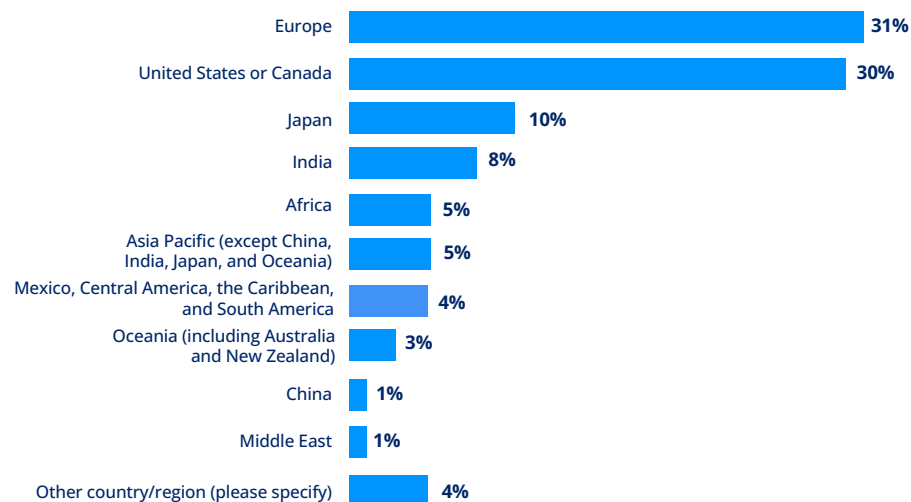
Survey data: Data.World

Linux Foundation Research makes each of its empirical project datasets available on Data.World. Included in this dataset are the survey instrument, raw survey data, screening and filtering criteria, and frequency charts for each question in the survey. Linux Foundation Research datasets, including this project, can be found at data.world/thelinuxfoundation. Access to Linux Foundation datasets is free but does require you to create a Data.World account.



FIGURE 6

In what country or region does your organization have its headquarters?



2024 World of Open Source Survey, Q7, Sample Size = 1,065 (answered by those who report being currently employed in Q4)

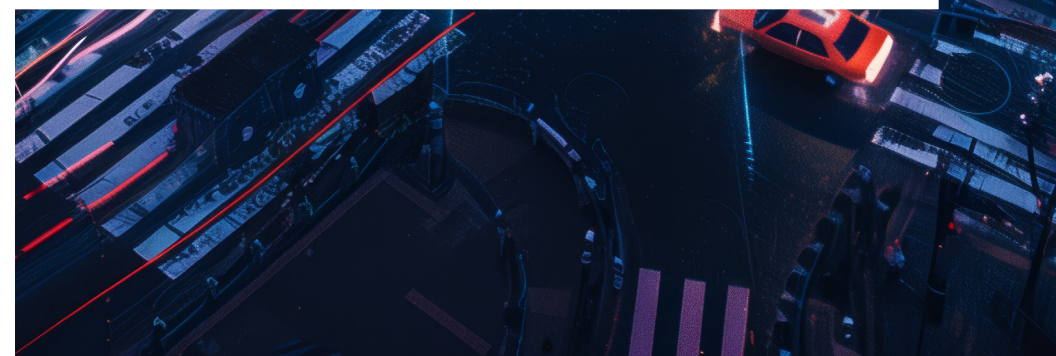
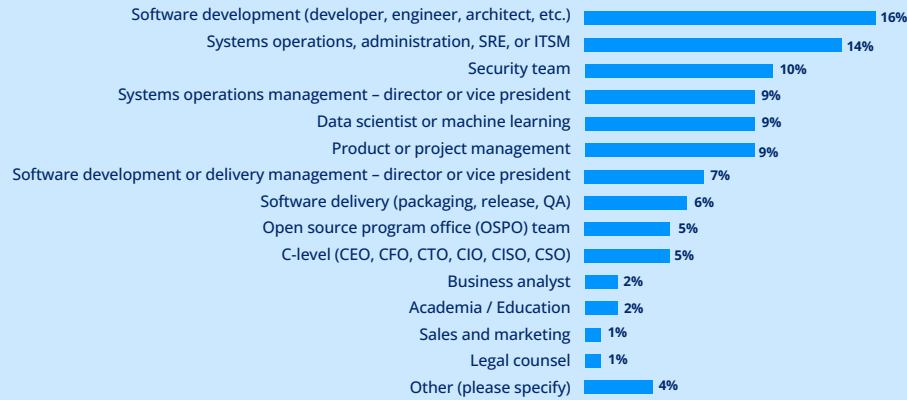


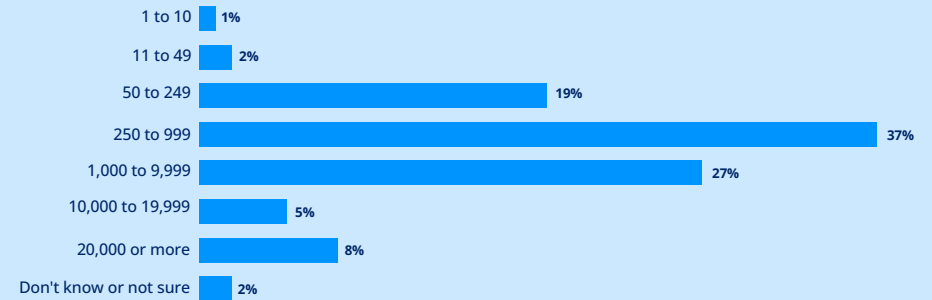
FIGURE 7

Professionally, which role do you most closely identify with?



2024 World of Open Source Survey (Japan), Q6, Sample Size = 106

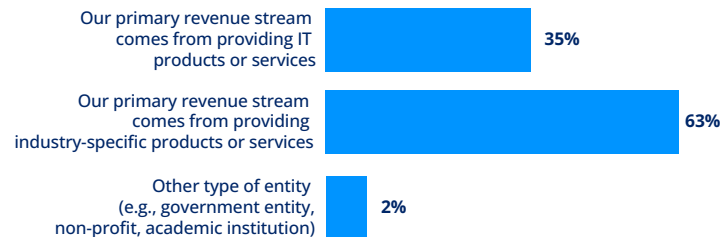
Please estimate how many employees your organization has worldwide.



2024 World of Open Source Survey (Japan), Q12, Sample Size = 106

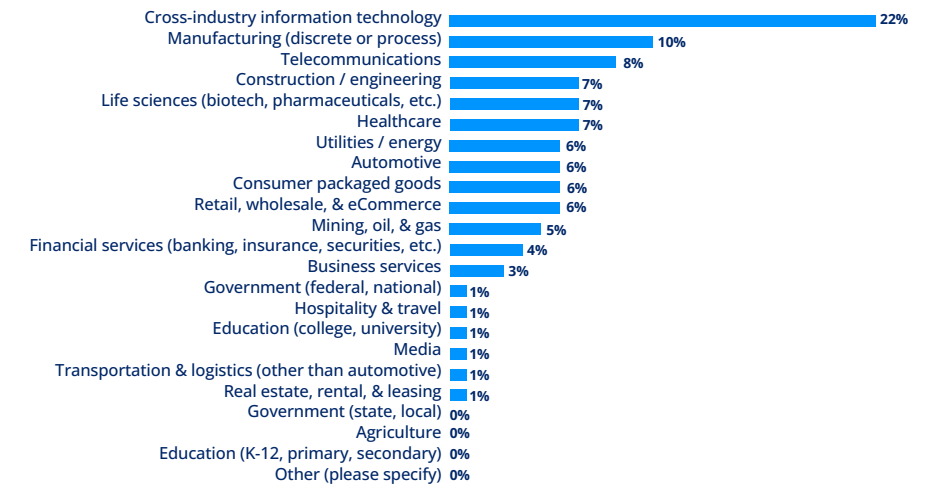
FIGURE 8

Which type of company or entity do you work for?



2024 World of Open Source Survey (Japan), Q8, Sample Size = 106

Which of the following best describes your organization's primary industry?



2024 World of Open Source Survey (Japan), Q11, Sample Size = 106



Founded in 2021, **Linux Foundation Research** explores the growing scale of open source collaboration, providing insight into emerging technology trends, best practices, and the global impact of open source projects. Through leveraging project databases and networks, and a commitment to best practices in quantitative and qualitative methodologies, Linux Foundation Research is creating the go-to library for open source insights for the benefit of organisations the world over.



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