



The Evolution of the Open Source Program Office (OSPO)

An OSPO maturity model featuring case studies from Bloomberg, Comcast, and Porsche

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In partnership with:



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Foreword

While open source software (OSS) arose organically with rapid bottoms-up adoption by developers, enterprises consuming open source realized over time that they needed to create governance structures and “guardrails” to ensure compliant use of this nascent and paradigm-shifting technology. The very elements that made OSS so powerful for accelerating technology innovation and so attractive to developers and “problem-solving” engineers—transparency, rapid iteration, collaborative innovation—were characteristics that often concerned legal teams and went against the grain of traditional technology development strategy.

It soon became clear that open source was not just a viable option but a critical path to technology innovation. Enterprises realized they needed to accommodate this new way of innovating or risk falling behind. Against this backdrop, initial organizational efforts focused on making sure that developers were complying with open source licenses and keeping inventory of OSS in use. In technology organizations, open source valuers were an integral part of the culture and often embedded in the products; conversations often went well beyond license compliance toward exploration of how these companies could leverage open source communities to speed up and improve product development while maintaining a commercial edge. On these two axes, the seeds of the Open Source Program Office (OSPO) germinated into formal programs that facilitated compliant open source use. Over time,

we’ve witnessed greater open source adoption, contribution, and community-wide participation, with much support from newly established OSPOs.

The TODO Group exists to foster best practices in OSS usage and community building. Increasingly, that means empowering enterprises and organizations to create effective OSPO programs. We have published numerous well-received guides and toolkits on how to build out OSPO programs. This publication seeks to provide a broader framework for understanding the archetypes of OSPOs and the maturity stages that we have seen in our work with thousands of enterprises and organizations as they have moved through their open source journeys. We also wanted to capture some actual “user journeys,” with real voices from real people relating their real experiences. We hope their insights inform existing and potential OSPO leaders of the nuances of fostering open source. This work provides guidance and a roadmap for these journeys, as the concept and structure of OSPOs continue to evolve with the open source movement.

Jim Zemlin
Executive Director, *The Linux Foundation*



Executive Summary

In our fourth TODO Group survey of open source practices, we found a positive evolution of the OSPO toward more professional organizations with greater dedicated funding and resources. This evolution fits the ongoing theme of continued growth and acceptance of OSS and development practices in organizations large and small. To gain more qualitative insights into how OSPOs were evolving, we interviewed leaders of noted OSPO programs, including some of the most influential technology firms, such as Red Hat, Microsoft, and VMware, as well as some one of the most iconic transportation brands and one of the largest media and entertainment companies. We asked them how their programs started and how they have evolved. Based on these interviews and the survey data, we mapped out a five-stage OSPO

maturity model, from (1) using OSS coincidentally to (2) addressing compliance and license issues to (3) encouraging participation to (4) contributing code, and finally, to (5) incubating and open-sourcing meaningful projects. In this report, we detail each of these stages and develop a handful of archetypes of OSPO organizations. As part of the process, we conducted three case studies of the evolution of three OSPOs in three different sectors—media, financial services, and transportation—each case structured as a journey through the stages of the OSPO. More than a couple decades into the OSPO movement, the role of the OSPO has grown to become a central source of expertise and a strong voice in developing and implementing technology strategy at the world's forward-thinking companies.

Introduction

The rise of the OSPO roughly mirrors the proliferation of OSS to build and run the most important technology applications within organizations in the world today. A [well-designed OSPO is the center of competency](#) for an organization's open source operations and structure. Its role can include setting code use, distribution, selection, auditing, and other policies, as well as training developers, ensuring legal compliance, and promoting and building community engagement that benefits the organization strategically. The OSPO concept is now about two decades old, but really started to accelerate in the last decade or so. Most prominent technology infrastructure firms (e.g., Amazon, VMware, Cisco) and consumer technology companies (e.g., Apple, Google, Facebook, and Twitter) have OSPOs or formal open source programs. All are encouraging their employees to contribute to open source projects that are strategic to their business and security.

Initially focused on license compliance in the early days, the OSPO often plays a broader role inside organizations today. OSPOs serve to educate developers and other employees about OSS by fostering best OSS practices and participation in OSS communities to make developers more efficient. Over time, OSPOs have evolved from engaging in existing projects to generating and launching projects to the broader community. Upper-level management is more likely to acknowledge the crucial role that open source technologies play in accelerating innovation and sharing software development costs across multiple beneficiaries. The tasks of the OSPO have advanced on critical fronts to include:

- Creating internal frameworks and tools for effective and efficient consumption of open source project code
- Providing strategic and tactical guidance on how an organization should guide employee participation in open source and which projects to support

- Evaluating open source projects and providing strategic guidance on the risks and rewards of adopting projects into the organization's long-term technology plans, with a focus on developer experience and efficiency

With this evolution has come greater reliance on OSS and the development of metrics to measure the impact of OSPOs on organizations, the impact of each organization on open source projects, and the general health of projects created and underwritten by the OSPO and its parent organization. The formation of OSPOs can be analogous to when organizations first started to establish CISOs as a reaction to security incidents. The organizations that established these centers of security competency protected and armed themselves for a better future. Those who did not suffer consequences, with poor security practices that had financial impact.

In short, what OSPOs focus on has evolved over time to match their new role. The purpose of this report is twofold: to present key findings from the latest annual OSPO survey and to provide context for these results through interviews with leading practitioners and experts. We conducted both a survey and interviews under the auspices of the TODO Group, an organization hosted by the Linux Foundation. TODO is an [open group of organizations](#) that collaborate on practices, tools, and other ways to run successful and effective open source projects and programs.

Survey Methodology and Respondent Composition

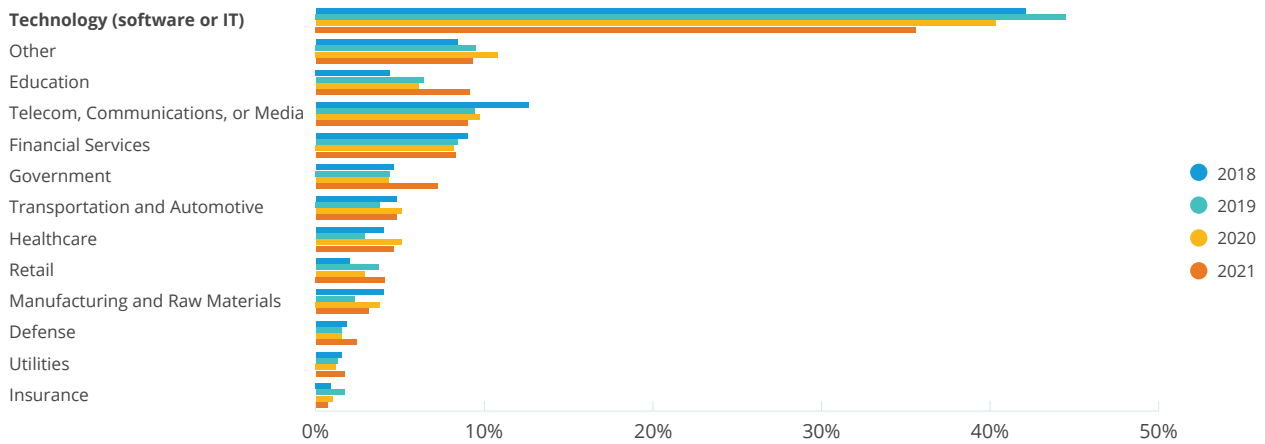
From June 10 to June 29, 2021, the TODO Group, in partnership with Linux Foundation Research and the New Stack, conducted a survey to better understand OSPO formation, operation, and

evolution. It was the fourth consecutive year the TODO Group has run the survey. We solicited respondents via social media and direct emails to the Linux Foundation, the TODO Group, and the New Stack subscriber lists. The final data set included responses from 1,141 survey participants. We derived conclusions from the 932 organizations with at least two employees. The makeup of respondents differed slightly from previous years, with more

describing themselves as “self-employed” or “not working.” In the 2021 survey, fewer respondents worked for tech companies than in previous years. Respondents came from a wide variety of industries, including education, telecommunications, media, financial services, government, transportation and automotive, health care, and retail. The largest increases in the percentage of respondents by industry were government, education, and retail.

FIGURE 1
OSPO Prevalence by Industry 2018-2021

Source: OSPO Survey 2021



Key Survey Findings

As the number of respondents to the OSPO survey expanded significantly in 2021, the composition of the survey respondents shifted to reflect the general economy, not just technology (although responses remain technology-heavy). Compared to 2019, a few trends emerged in the perception of OSPO roles, priorities, and values. While the percentage of responses from organizations with OSPO programs fell across all organization sizes, the decline was least pronounced in larger organizations. This decline may reflect the change in survey composition: It includes industries such as education and government, where open source programs are in their infancy. The decline might also relate to economic and staffing challenges due to COVID-19.

Even so, the OSPO movement has room to grow. Clearly, OSPO advocates must become more effective at communicating the value of creating an OSPO specifically and of consuming OSS and contributing to open source communities more broadly. The survey revealed that organizations use more OSS than they contribute to OS projects, and responding organizations are not fully aware of OSPOs:

- 19% said they have never heard of OSPOs.
- 28% said they see no business value in OSPOs.
- 35% of organizations that have no OSPO said they haven't considered opening one.

The survey also revealed hopeful signals. Respondents were twice as likely as last year to believe that funding for their company's open source initiatives would increase this fiscal year because of macroeconomic conditions. To that end, 51% said a funding increase was very or somewhat likely. The survey data showed an increase from 54% to 63% in respondents saying the OSPO was very or extremely critical to the success of their engineering or product teams. OSPOs are also growing more professional through formal structures. The 2021 survey found that 58% of OSPOs are formally structured, up from 54% in 2020. In the open-ended sections of the survey, respondents highlighted many valuable benefits of OSPOs, such as improved code quality, better leverage of OSS tools like continuous integration/continuous delivery (CI/CD) pipelines, and a positive linkage between external collaboration (open source) and internal collaboration (inner source).

The key duties of an OSPO shifted somewhat. Maintaining open source license compliance reviews and oversight dropped from 68% to 59% of survey participants citing it as a primary responsibility. For large non-tech companies, compliance remained the most cited primary responsibility, at 86%. Engaging with developer communities as a primary responsibility rose from 48% to 56%. The emphasis on developer relations and engagement increased external contributions to in-house open source projects from 38% to 47%, among several positive metrics associated with ecosystem participation and evangelism.

The Five-Stage OSPO Maturity Model

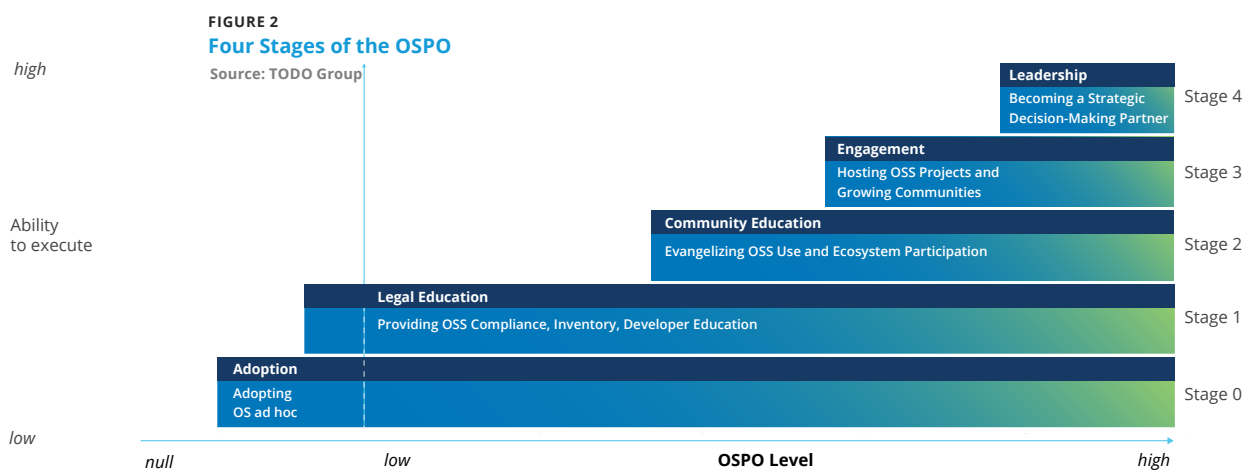
As OSPOs have proliferated and become more common, these programs have matured. By mapping conversations with OSPO leaders and experts to the OSPO survey results, we have developed an OSPO maturity model to describe the typical evolution of OSPOs. The model is general: The size and the type of the organization affect how the OSPO matures. In larger organizations, multiple business units might develop different approaches to open source, each with a different technology culture; and pure digital technology companies are far more likely to consume and contribute to OSS early and have greater exposure to open source technologies and concepts.

Consider VMware, an enterprise infrastructure software provider. Its engineers work with and contribute to many open source communities in networking, cloud, and other key areas simply because they know that when building with open source it results in better outcomes and increased interoperability—for the community and VMware’s customers. In contrast is Red Hat, the first open source company to go public. It built its entire business practice on OSS, compressing its maturity life cycle and, in effect, making its entire company something of an OSPO. Today Red Hat dedicates more resources to earlier life cycle activities, such as educating internal stakeholders (e.g., sales teams, marketing personnel, new engineering hires) and fostering collaboration in upstream communities. For most other companies in our study, the general stages of the maturity model closely map the organizational OSS trajectories in terms of consumption, contribution, collaboration and participation, and leadership. Some of the organizations we spoke with now include specific metrics for open source participation and usage.

These metrics may include engineering participation rates in OSS projects (pull requests, comments, commits), attendance and participation at open source events, blog posts written, talks given, and participation in open source project slacks, to name a few. More advanced open source organizations may have metrics around successful growth of projects launched from or partly created by their own engineering teams. Some leading organizations, such as Comcast, VMware, and Red Hat, have built or are building advanced metrics and measurement tooling.

That said, even some sophisticated organizations that are tracking metrics do not use metrics explicitly to track or set OSS goals. Consider Microsoft, an organization that once focused almost exclusively on proprietary software but has become a leading supporter of open source projects and an extensive user of OSS for its own products. “We focus on making it easy for our developers to work with [OSS], and we encourage them to contribute back to the projects they depend on. We track overall participation, but the Open Source Programs Office does set a goal at an individual or team level,” said Stormy Peters, former head of the OSPO at Microsoft. “Our developers can voluntarily associate their company ID with their GitHub login, which allows us to measure participation at a company level.”¹ For the most part, the systematic collection and analysis of metrics occurs in the later stages of adoption, when OSS becomes a key element of the technology road map and strategy for enterprises and larger organizations, concurrent with the growth of OSPO programs, budgets, and staffs.

1 Stormy Peters, Zoom interview with author, Nov. 19, 2021



Stage 0: Adopting Open Source Ad Hoc

Today, almost all organizations use OSS. How they adopt and initially use it varies. They may use OSS as a building block or library in a product or tool or a key part of a vendor’s product stack or supporting the vendor’s service offering. Developers may use OSS for rapid prototyping or for microservices and small applications. Developers also frequently adopt OSS development tools such as integrated development environments (IDEs), or tools built on top of open source like GitHub and GitLab. Modern cloud native applications, almost by default, use open source systems for container orchestration, observability, data storage, messaging, and more. On the front-end of applications, developers rely heavily

on open source libraries and frameworks. Red Hat reported that “90% of IT leaders are using enterprise open source.” Software composition analysis vendors like Synopsys determined that over 75% of all codebases contained open source components.²

In other words, nearly every organization is using open source. However, the very earliest form of adoption is ad hoc, by developers solving problems using readily available tools and technologies. This “ad hoc adoption” usually means little thought is given to license compliance outside the defaults or to longer-term impacts of consuming open source and distributing products built with open source components. In most of these instances, a few engineers are actively seeking out open source while the

2 “2021 Open Source Security and Risk Analysis Report,” Synopsys Inc., May 14, 2021, p. 6. <https://www.synopsys.com/software-integrity/resources/analyst-reports/open-source-security-risk-analysis.html>, accessed Jan. 4, 2022.

rest of the engineering organization may use open source coincidentally but does not view its activities as dependent on open source. Consequently, the organization has neither a centralized team focused on open source nor a top-level open source strategy for the organization. These are critical because, once adopted, those open source components become part of the organization software supply chain by default, which makes a strategic approach all the more imperative.

Stage 1: Providing OSS Compliance, Inventory, and Developer Education

In general, an organization forms an OSPO when it realizes that its people are consuming open source products and code across nearly all engineering and development departments and functions. This usage is typically internal, not part of products or services to customers or users. In reality, any organization with a considerable IT function and an advanced online or application-centric presence uses open source, because of the ubiquity of open source throughout the technology stack—from Linux servers and MySQL databases to programming languages like Node.js and Python and front-end frameworks like React and Vue.js.

At this early stage, organizations often use many different names for the OSPO. IBM initially called its programmatic open source efforts the “[Open Source Steering Committee](#),” for example. In all cases, however, organizations in Stage 1 recognize that OSS is a key part of their business and technology strategy. They understand that the security practices of OSS projects differ from those of proprietary software companies. For example, disclosure rules of OSS projects tend to be stricter than those of proprietary projects. So they must identify their legal and security risks. Risk mitigation strategies include careful licensing, developer education, and rigorous inventory-taking.

Managing Legal Risks and Licenses

An organization’s legal team or technology leaders tend to launch Stage 1 development of an OSPO to ensure that its employees (and contractors, suppliers, etc.) all use OSS according to its license terms and that the organization’s OSS consumption is not putting it at legal risk. There are dozens of [OSS licenses in use](#). In the 2020 survey, respondents ranked compliance as the top benefit of OSPOs of larger companies, and compliance remains the second leading benefit for medium-size companies. “Companies usually start out with a lot of confusion. There are no policies for license compliance in place, and developers do what they feel is right,” said Dirk Riehle, professor of open source software at the Friedrich-Alexander University Erlangen-Nürnberg. He added:

I once walked into a company, and one developer said: We have no open source policy. Another quipped: We do, and it is: No open source. To which a third commented with a frowning face: “What are you talking about? We have been contributing to open source projects for a while now.” This is not unusual. They will eventually set up an open source program office with the mandate to get a handle on open source use and contribution.³

While OSS users have always considered legal compliance, some OSS contributors have designed new licenses to discourage large cloud providers from creating proprietary services based on open source projects. The most prominent of these is the Affero General Public License ([AGPL](#)). A company might use OSS released under the terms of this license to deliver proprietary software-as-a-service (SaaS) to its customers, but the creator of the OSS might have grounds to sue the company for license violation if the AGPL terms do not clearly distinguish between internal and external delivery. Many businesses also have internal financial charging systems between units, further blurring the line between a paid service and an internal service.

3 Dirk Riehle (Professor, OSS, Friedrich-Alexander University Erlangen-Nürnberg), Zoom interview with author, Sept. 9, 2021.

Educating Developers

To maintain compliance, organizations in Stage 1 of OSPO maturity create education programs to help their developers decide when to use OSS in creating new products or services. “Many developers who are not educated in open source think that because they are not purchasing software, there is no license involved because they didn’t sign a contract,” said Suzanne Ambiel, director of open source marketing and strategy at VMware. “Open source software may be free—as in priceless—it can also be costly if used in a noncompliant way. [OSS] always comes with a license. One of the most important roles of any OSPO is to make sure developers understand the implications of different license choices.”⁴

Through developer education, senior management often acknowledges the value and importance of OSS. In such programs, developers learn:

- The nuances of different license types
- The formal approval processes for introducing new OSS products
- The real risks of noncompliant OSS consumption, including the usage of OSS products from projects or code without formal licenses
- The use of contributor license agreements (CLAs) to cover an organization’s developers who contribute to open source

Sometimes the organization introduces a formal CLA policy at this stage. It may also provide guidance on judging the health of OSS projects as part of its criteria for deciding which OSS to use in the organization’s technology stack or infrastructure.

Taking Software Inventory

Developers may deploy OSS ad hoc without cataloging their efforts systematically. The legal team and technology leadership tend to push for an inventory of all OSS in use in an organization. Such an inventory itemizes OSS in organization’s code repositories (e.g., GitHub, GitLab) and systems. Stage 1 organizations set up specific software inventory processes to create an organization-wide software bill of materials (SBOM). With this inventory, the legal team—usually working with the OSPO team—can continuously monitor OSS usage and flag legal, security, or other project risks. With a detailed SBOM, technology leadership such as a chief technology officer (CTO) or chief information officer (CIO) can identify and closely monitor the most business-critical uses and preserve organizational security.

Stage 2: Evangelizing OSS Use and Ecosystem Participation

After organizations recognize the value of OSS and the need for compliance, education, and an SBOM, they begin to realize the economic benefits of OSS usage and seek to expand it. OSPOs in Stage 2 create such internal mechanisms as ambassadors who promote usage of approved OSS products, educational programs on good OSS hygiene, and technical training or tuition reimbursement for skill building and certification in OSS. With these initiatives, an organization can grow its use of OSS and amplify its message that OSS is not only important but desirable and preferable to proprietary software products.

Employee education includes laying out best practices in interacting with OSS projects such as how to request features, file bug reports, and contribute basic code. During this stage, the organization strengthens its collaborative muscle and experiences the social life of an OSS project and community. At this point, the

4 Suzanne Ambiel (Director, Open Source Marketing and Strategy, VMware), Zoom interview with author, Oct. 12, 2021.

OSPO communicates to employees and managers the importance of contributing to and not merely consuming OSS. This outreach includes advocating for and driving event sponsorships, booking project leads and maintainers as speakers or panelists in public coding forums, and securing organizational resources (e.g., talent, funding) to mission-critical OSS projects.

First coined by publisher and technology venture capitalist Tim O'Reilly in 2000, the term inner source has come to describe collaborative innovation efforts inside companies that mimic some, but not all, of the characteristics of classic OSS communities. Inner source advocates seek to form internal communities that maintain and develop software that multiple teams can use for multiple applications. This approach differs from the siloed model of software development with teams working on projects, sometimes duplicating efforts. Inner sourcing was, in effect, an endorsement of open source practices and an attempt to adopt those that would accelerate software innovation inside companies. However, as a rule, inner source software is usually proprietary, not intended for publication via an open source license. That said, inner sourcing software may be a test run for later open-sourcing the same software. Companies such as PayPal and Comcast have active inner source programs and inner source evangelists. Inner source often collaborates closely with or even works under OSPO management. The two approaches are generally seen as neighboring points on the software development continuum.

For organizations, active and visible participation yields multiple benefits: better visibility, better reputation, more attractive employer. To this end, many non-tech organizations purchase booths at prominent OSS events to interact more with those communities and recruit developers who enjoy working in OSS ecosystems. Technology companies active in open source may extend education programs to customers who want to interact with OSS communities and vendors. "We get so many requests from our customers

asking for help and guidance on how to participate in open source or how to contribute or collaborate with us on projects," said Deborah Bryant, senior director of open source at Red Hat.⁵

As they advance in Stage 2, organizations begin incentivizing their developers to work on OSS projects critical to their operations, to the degree that developers become highly active contributors or primary maintainers. To technology organizations, employing a contributor to a prominent OSS project is a valuable investment: most of their contributors to, say, the Linux kernel—the core component of the Linux operating system and the critical interface between computer hardware and software—are full-time employees (FTEs) whose job is to write code for Linux.

Outside the technology sector, fewer organizations can assign FTEs to open source work, but they are doing it. For example, both Comcast and Bloomberg have employees working full-time on OSS projects. In this stage of the life cycle, OSPOs begin exploring how to streamline processes for developers to consume OSS. Such developer efficiency may include simplifying CLAs, adding OSS with acceptable license types to ticketing systems for fast approval, promoting reuse of OSS architecture and software in place (a variation on inner-sourcing), and standardizing library selection and open source development tools, thereby blending OSPO and platform operations duties.

At this stage, organizations turn to OSPOs for guidance on how to engage positively with open ecosystems. "You have to make sure that you give back just as much as you take in. You don't want people to think you are just monetizing open source without contributing back to the community," said Chris Xie, head of the OSPO at Futurewei Technologies. "We take that strongly into account—more strongly than ever."⁶ Companies in regulated sectors like telecommunications must also understand their national export laws and navigate

5 Deborah Bryant (Senior Director, Open Source, Red Hat), Zoom interview with author, Aug. 24, 2021.

6 Chris Xie (Head of OSPO, Futurewei Technologies), Zoom interviews with author, Aug. 24 and Sept. 30, 2021.

political tensions to preserve the OSS community and steer clear of international entanglements.⁷ "We always want to make sure our contributions are truly open, benefiting the community, and benefitting the industry at large," Xie explained.

Usually in Stage 2 of the OSPO maturity cycle (or sometimes in Stage 1, if the company is a software or core technology company), OSPOs begin to streamline and optimize open outbound source contributions for their developers. The process of requesting and getting approval for outbound participation is usually ad hoc and painful in the early days. "One of the first things we looked at when we established the OSPO was the process for contributions," said Michael Picht, chief architect of the OSPO at SAP. "Using Word, Excel, and email, the process was not automated at all. When we opened the OSPO, one of the first things we did was simplify the process and implement end-to-end tool support. We use GitHub issues for the different process steps."⁸

Stage 3: Hosting OSS Projects and Growing Communities

At Stage 3, organizations initiate and then host or act as primary sponsors of OSS projects. They will dedicate one or more FTEs to a project, and they accept responsibility for nurturing a project community and ensuring its health. They don't confuse this level of organizational commitment with individual employees who decide to open-source their projects. In Stage 3, organizational leaders support incubating and launching open source projects into the public sphere because they understand how these projects benefit their organization. Such projects tend to offer better performance and economics on crucial capabilities that may be

noncore to the organization's value proposition but critical to its technology infrastructure.

In addition, organizations that create and launch open source projects establish broad credibility in the open source community; the possibility of working on open source technology is attractive to many developers. Most of the OSPOs we spoke with cited recruitment of new engineering talent and retention of existing talent as a key motivation of the open source effort. In a [recent study by the Linux Foundation Research](#) of the financial services industry, 53% of contributors said they contributed to OSS because "it's fun."

Supporting a project with FTEs and funding is true skin in the open source game. Organizations that cross this threshold and successfully launch multiple open source projects develop internal resources and processes that can incubate and ensure the success of these projects post launch. OSPOs are more than just gatekeepers and mentors for project formation and launch; they educate project creators on the requirements for cultivating a healthy open source ecosystem, and they coach project leads to prepare them for a more public leadership role required of an OSS project.

As an OSS organization matures, its OSPO develops internal processes, playbooks, checklists, tooling, and other mechanisms to vet, organize, and operate open source projects and to prepare and coach their leaders. Some OSPOs prefer to launch projects with the assistance of the major open source foundations or collaboratives, such as the TODO Group, to enhance capabilities or provide infrastructure, tactical assistance, and other resources. This preference is less resource intensive but cedes control of a project to a broader community.

7 See, for example, Robert W. Hahn, "Government Policy toward Open-Source Software: An Overview," Government Policy Toward Open-Source Software, Brookings Institution Press and American Enterprise Institute, 31 Dec. 2002. https://www.brookings.edu/wp-content/uploads/2016/07/governmentpolicytowardopensourcesoftware_chapter.pdf, accessed 19 Oct. 2021.

8 Michael Picht (Chief Architect, Open Source Program Office, SAP), Zoom interview with author, Nov. 8, 2021

Stage 4: Becoming a Strategic Decision-Making Partner

At this maturity stage, the OSPO becomes a strategic partner for technology decisions, helping to guide choices and shape long-term commitments to projects. At Stage 4, the CTO and other technology leaders consult the OSPO and its leadership on which open source technologies to rely on and which decision criteria to use in judging open source projects. Because major open source technology choices tend to generate significant secondary and tertiary costs and affect upstream and downstream technologies as well as hiring plans, the choice of open source projects becomes a major business decision.

In broad terms, OSPOs provide three types of strategic guidance in Stage 4. First, the OSPO advises the CTO and technology leadership on which open source technologies to adopt or remove from the organization's technology stack. Given the many OSS options today—with most major categories of software featuring dozens of choices, as shown in Figure 3—the OSPO can provide insights into OSS trends, such as popularity of different languages, designs of APIs, or capabilities of different NoSQL databases. In this role, the OSPO becomes an internal technology consultant to the CTO and the in-house expert on OSS.

In a second type of strategic guidance, OSPOs take the lead on benchmarking what constitutes an acceptable OSS project. The OSPO often evaluates the behavior and performance of the project, especially changes in license type that limit usage, or abrupt shifts in the project roadmap, to determine whether a project manager has the best interests of the community in mind. Most OSPOs rely on back-of-the-envelope metrics to evaluate project behavior such as:

- Which type of license does it have?

- What is its code of conduct, and what are the consequences for breaking it?
- What is its governance structure, and does this structure ensure independence?
- How long does it take to respond to pull requests or bug filings?
- How frequently does the project ship new versions?
- Does one party (company or organization) or a whole community control the project?
- How many contributors does the project have? How has that number changed over time?

A third type of guidance is helping organizations understand and navigate project politics, such as maintaining a neutral stance when multiple influential actors are attempting to steer a project, or illuminating the latent political considerations of community members. At a higher plane, OSPOs can help companies maintain a neutral posture on techno-nationalism and bridge political differences by cultivating personal and working relationships that transcend national boundaries and political realms. Increasingly, this value extends to the work of foundations and nonprofits, as those realms become important neutral spaces in open source.

According to Deborah Bryant of Red Hat, her OSPO has had to manage the cost of participating in open source foundation work, between sponsoring and dedicating staff to fill leadership roles. “We have found that we have needed to spend more time on some central management and administration of our participation in software foundations to ensure that we were getting a return on our investment and to re-evaluate our participation on a regular cadence,” she said.⁹

⁹ Deborah Bryant (Senior Director, Open Source, Red Hat), Zoom interview with author, Aug. 24, 2021.

In this role, where the OSPO has a multimillion-dollar foundation budget, the strategic importance of participating in OSS ecosystem formation and growth parallels the monetary investment in foundations and nonprofits. During this stage, we tend to see rapid growth in the OSPO. According to Ambiel of VMware:

One of the OSPO's primary goals today is to help with best practices in coaching and how to be a good open source citizen. When you are in the open source community, you are participating in the open—everyone can see what you are doing. It's important that an organization brings its best. The OSPO helps people do that consistently and confidently, be it for speaking at a conference or contributing a small library to participating in a big project community, such as Kubernetes.¹⁰

¹⁰ Suzanne Ambiel (Director, Open Source Marketing and Strategy, VMware), Zoom interview with author, Oct. 12, 2021.

FIGURE 3
Cloud Native Landscape
 Source: [Cloud Native Computing Foundation](https://www.cncf.io/cloud-native-landscape/), accessed 22 Feb. 2022.

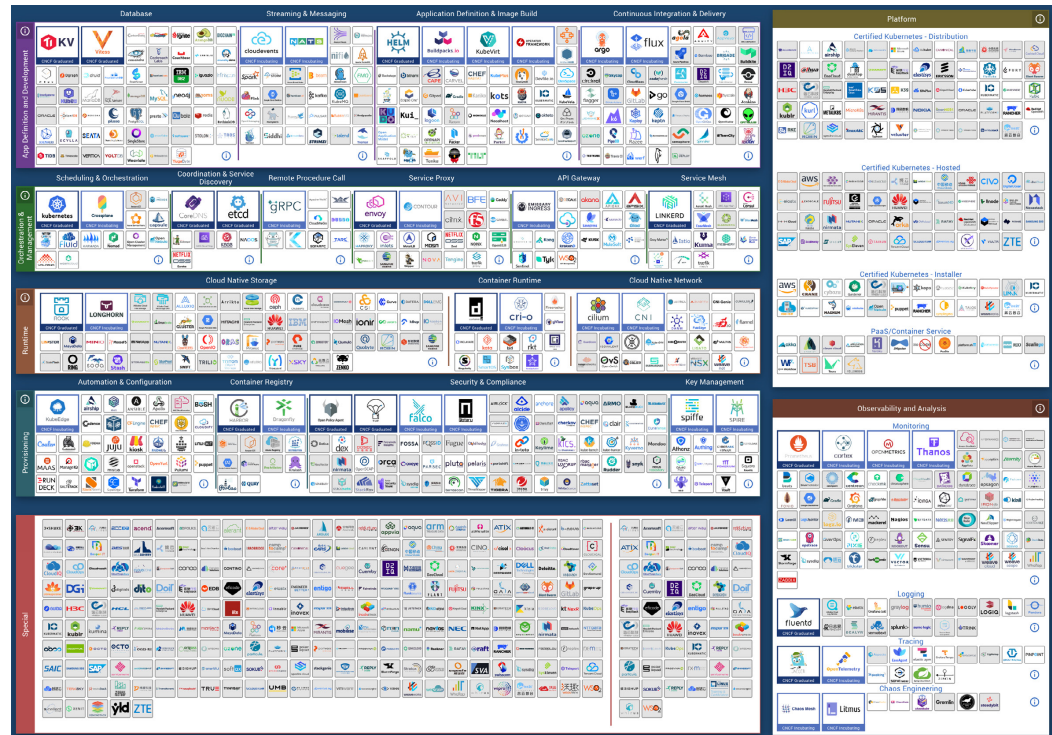


FIGURE 4
OSPO Personas
 Source: TODO Group



OSPO Archetypes

A question that often comes up is, what are the various archetypes of OSPOs and how do they differ? To a certain degree, any organization calling itself an OSPO likely indicates that the organization has reached a maturity stage and critical mass, where it OSPOs share key characteristics:

- Employees are tasked with fostering and nurturing OSS usage.
- The organization has a formal policy around the use and production of OSS.
- Executives recognize that OSS and open source more broadly are important strategic assets.
- Significant numbers of employees are contributing code to open source projects.
- Processes, procedures, and tools are in place to streamline and facilitate open source consumption and participation.

For this paper, we interviewed OSPO leaders primarily working at large enterprises headquartered in North America, the European Union, and Asia. With this limited sample size, we cannot properly observe archetypes for smaller organizations, noncorporate entities, and organizations headquartered in other areas. (A more detailed and granular archetype study would benefit the OSPO movement). Based on interviews we conducted for this paper, we have identified a handful of broad archetypes that drive differentiation in OSPO behavior.

Industry Collaborative

OSPOs in this archetype view open source as a platform not only for general technology development, but as a way for their specific industry to become more efficient through sharing costs and innovation for industry-specific needs. In the European Union, many of the major automotive companies have formed a loose OSPO coordination consortium that prioritizes key OSS initiatives for automotive and collaborates on software development for those initiatives. This consortium also works on non-industry-specific OSS problems, such as creating and maintaining a stack of tooling to automate OSS compliance and verification.




INDUSTRY COLLABORATIVE

Description
View open source as a way for their specific industry to become more efficient through sharing costs and innovation for industry-specific needs

Example
Automotive companies from the European Union

Cross-Industry Collaborative

OSPOs with this archetype are eager to work on foundational technology problems that cross industries. This work often takes the shape of other tooling to automate consumption and compliance of open source work on open source programming languages and frameworks, such as JavaScript and Node.js. Bloomberg, for example, worked with Microsoft to make contributions to TypeScript (a JavaScript relative) and to create a better tooling structure that would allow Bloomberg engineers to contribute back code more easily.



CROSS-INDUSTRY COLLABORATIVE

Description
Eager to work on foundational technology problems that cross industries. This work often takes the shape of other tooling to automate consumption and compliance of open source work on open source programming languages and frameworks

Example
Bloomberg worked with Microsoft to make contributions to TypeScript

Big Project Facilitators

These are the rare OSPOs that form or facilitate the formation of large, complex open source projects inside an organization and then launch them as publicly available projects. The overhead and commitment level for such projects are high. Continued development of the code and growth of the community both require considerable work with time and monetary investments. For this reason, most OSPOs do not seek to launch big projects from their organizations. Rather, when a big project does launch, the company usually donates it to a foundation as part of the launch. The big project also plays a key strategic technology role for the OSPO's parent organization. For example, Comcast incubated the Apache Traffic Control Project, which is a top-level project in the Apache Foundation. Traffic control was a key technology component in Comcast's software and services stack, used for delivering mission critical content to live customers.




BIG PROJECT FACILITATORS

Description
Rare OSPOs that form or facilitate the formation of large, complex open source projects inside an organization and then launch them as publicly available projects

Example
Comcast incubated the Apache Traffic Control Project

Open Source First

A key job for many OSPOs today is helping the company and its technology teams to prioritize OSS consumption and make open source the first choice by default for any technology initiative. These OSPOs tend to work closely with CTOs and company strategists to map open source projects and capabilities. Open source first OSPOs are acutely aware of trends in [copyleft](#) licensing and other restrictive forms of open source licensing.




OPEN SOURCE FIRST

Description
Helping the company and its technology teams to prioritize OSS consumption and make open source the first choice by default for any technology initiative

Example
OSPOs that work closely with CTOs and company strategists to map open source projects and capabilities

Technology Strategy Experts

Closely related and often overlapping with open source first archetypes, this OSPO archetype plays a key role in evaluating viable open source technologies and helping the organization's CTO and vice president of engineering to lay out a technology roadmap. This consultative role usually indicates a similar approach at lower levels, where the OSPO and its members or ambassadors may act as internal consultants to help developers and teams better understand, interact with, consume, and plan around open source technologies.




TECHNOLOGY STRATEGY EXPERTS

Description
Plays a key role in evaluating viable open source technologies and helping the organization's CTO and vice president of engineering to lay out a technology roadmap.

Example
An OSPO which its members may act as internal consultants to help developers and teams better understand, interact with, consume, and plan around open source technologies

Software Company

Because these companies produce the same good that underpins the core of the open source movement, OSPOs at software companies tend to have slightly different characteristics. In these companies, open source is often well understood and used in some capacity by the vast majority of developers. This archetype is far more likely to incubate or participate in big projects and more likely to have dedicated developers working exclusively on open source. For example, software and technology companies dominate the core development team of the Linux Project. A sub-archetype is the technology company that depends heavily on OSS and must design to meet OSS community needs. Semiconductor companies such as Intel and Qualcomm fit this description.



SOFTWARE COMPANY

Description
Helping the company and its technology teams to prioritize OSS consumption and make open source the first choice by default for any technology initiative

Example
OSPOs that work closely with CTOs and company strategists to map open source projects and capabilities

This list of archetypes will evolve as we conduct more research on the activities of OSPOs and the organizations they support. Equally instructive are detailed examinations of the formation, organization, and utilization of OSPOs through interviews and case studies.

OSPO Case Studies

TABLE 1
Company Profiles

	Comcast	Bloomberg	Porsche
OSPO Age	5 years	9 years	2 years
Number of FTEs in OSPO	5-10	2	DND
Prominent Projects Incubated	Apache Traffic Control, Trickster, Kuberhealthy	KServe, bqplot, PowerfulSeal	Porsche Design System, OSS Review Toolkit, Cookie Consent Banner
Metrics	Detailed collection	Prefers holistic approach	Some contribution metrics and best practices
Number of Developers	1,000s	6,500+	DND
Reports to	CTO	CTO	CPO (Chief Privacy Officer)
Number of Dedicated OSS Developers	100s	DND	10-15

Bloomberg

OPEN SOURCE ACROSS INDUSTRIES

Bloomberg is a provider of data, news, and analytics to the world's leading investors and financial services companies. Bloomberg began formally engaging with the open source community in 2012, and its involvement now includes hundreds of people across the company's 6,500+ person global engineering workforce. Bloomberg frequently uses OSS and contributes significant code to dozens of external open source projects.

In areas especially relevant to Bloomberg infrastructure needs, such as indexing, machine learning, visualization, and the core JavaScript/Node.js language for middleware and presentation

layers, the company's engineers have become project leaders and key committers. In the [Apache Lucene](#)/Solr project, which powers core functions of the Bloomberg platform, a company employee is on the project management committee. Bloomberg has incubated and released multiple open source projects into the community. For example, Bloomberg technologists have collaborated with other organizations to create independent open source projects and thriving communities such as [the KServe project](#) for easier use of common machine learning software and model serving on Kubernetes.

BLOOMBERG'S OSPO JOURNEY

Bloomberg began its OSPO journey in 2012, when engineering leadership realized that its engineers were consuming open source

at a large scale inside of Bloomberg. Early and prominent contributors to the JavaScript and Node.js communities, key Bloomberg employees were already immersed in open source. Bloomberg's technology leadership had also realized the strategic and business value of OSS and was planning to shift its software technology stack to emphasize open source over proprietary code.

Back in 2012, the OSPO movement was still in its infancy, and Bloomberg had few examples of OSPOs outside large technology companies (and few official OSPOs even inside of tech companies). Kevin P. Fleming, the former head of technology community engagement at Bloomberg, told us, "During the year before I started at Bloomberg, there was an ongoing discussion between people in engineering about leveraging OSS and cloud infrastructure with the office of the CTO. They came to the realization, 'We didn't just want to be consumers [of OSS]; we wanted to be collaborators.'¹¹

As the first OSPO hire in the company's CTO Office, Fleming was tasked with creating an OSPO from scratch to help unlock open source for a company that had traditionally treated all code like many other organizations—as intellectual property that it had to protect. "Bloomberg had been very insular and protective of everything. We came from the world of proprietary software," Fleming said. He had served as an engineering leader at small companies with significant open source project exposure, up to maintaining and growing entire projects. "So we had to learn how to be members of the open source community and straddle the boundaries of proprietary code and open source."

As an organization with advanced legal thinking, Bloomberg had defined policies around open source compliance and consumption, but the existing policies were designed to govern internal consumption. What it needed was guidance and definition on how to participate actively in external open source ecosystems. For

example, when Fleming arrived at Bloomberg, company engineers did not speak about their work on open source at technology conferences. They had a tacit understanding that the company frowned upon public discussion about internal technology. Fleming explained:

My mandate wasn't about compliance. It was about enablement. If we are going to choose these [OSS] tools to replace vendor-provided tools, how do we put ourselves on a path to be a productive member of the community, and not be an organization that takes releases and deploys them, but wonders, "How we will get support when we need to get changes made or answer questions?"¹²

A few years into Fleming's tenure, the person in charge of technology events left the company, and Fleming arranged to move that responsibility over to the OSPO. This move was a logical expansion of Bloomberg's public outreach and its ecosystem footprint; Fleming was already involved in reviewing content proposals for external speaking. Bloomberg's open source philosophy also drove its sponsorship policies, underwriting or speaking at community-driven events, but not corporate events. "We are happy to sponsor or speak at an Apache Spark conference, but not one put on by a company that sells a service built on Spark with proprietary modules," he said, to give an example.

In time, Bloomberg's OSPO evolved not only to foster community participation, but also to provide necessary guidance and support to teams thinking about launching open source projects. To simplify education, Fleming and the team at Bloomberg wrote an internal handbook outlining all the considerations and steps a team or employee should take before launching. Echoing many of the TODO Group's best practices, Fleming customized the handbook to Bloomberg and its specific internal processes and decision-making practices.

11 Kevin P. Fleming (Former Head of Technology Community Engagement, Bloomberg), Zoom interview with author, Sept. 24, 2021.

12 Kevin P. Fleming (Former Head, Technology Community Engagement, Bloomberg), Zoom interview with author, Sept. 24, 2021.

The process is nuanced and takes into account many factors. "If someone brings a potential project to launch, we call in one of our internal subject matter experts to look over the code," Fleming explained. "They might say, 'The code looks old; no one writes Python that way anymore,' and that's a consideration because we do not want to be perceived in the community as pursuing dated practices or releasing lesser code." Teams looking to release code must also commit to fostering community and responding to bugs and pull requests. "If we are going to release a project, the engineers must obtain a commitment from their managers that they will have sufficient time to support the project," he said.

The role of the Bloomberg OSPO progressed from tactical to strategic. "At the beginning, when the knowledge of open source practices weren't well distributed around the company, the bulk of the work we did was tactical—let's get a specific thing done," said Fleming.

As more and more people from management down to individual contributors understood that we wanted to build better relationships and broaden engagement and usage of open source, we became advisors in strategic decision-making. Should we use this particular project from this community? Does it look like a real community, or is it being run by a single company or individual? We helped answer those questions.¹³

In other words, community health and behaviors have become key determinants in the company's technology investments.

Fleming told us that Bloomberg regularly collaborates with open source companies to help them understand what sorts of behaviors and governance structures they need to cement longer-term commitments for use of their software. Fleming said,

In my history, people have come to us and said, "We want to use this software!" and we said, "The software is solid, but the community is not healthy. We don't know what the future of that project is. Maybe we should consider using an alternative because we might find ourselves in a place where we have to switch to an alternative in the future, and it will cost a lot more."

This practice has extended beyond initial decisions to retracting resources from projects that change licenses or governance in ways that go against Bloomberg's preferred best practices. Said Fleming,

We don't allow our engineers to contribute to things that are not under the right kinds of open source licenses. As a project changes licenses away from OSI-approved licenses to their own license types, we may not be able to contribute to those projects anymore, as they are no longer true [OSS]. We might recommend disinvestment in those projects.

Further, Bloomberg's OSPO has helped the company establish an open policy prioritizing community-based open source technologies with independent governance and vibrant, diverse memberships. "When an infrastructure team is considering a replacement of a technology that powers an internal service offering, our very strong preference is to first try to find an OSS solution to solve that problem," explained Fleming. "If they can find something that solves 90% of the problem and we can build expertise to deliver the remaining 10%, we will do that. Only when we can't find something that close will we consider a proprietary vendor or something we don't consider to be open."

In June 2021, Bloomberg added a second FTE to the OSPO, Alyssa Wright, who has a deep background in OSS, including board leadership at OpenStreetMap. Wright and Fleming plan to extend

13 Kevin P. Fleming (former Head, Technology Community Engagement, Bloomberg), Zoom interview with author, Sept. 24, 2021.

Bloomberg's open source knowledge and practices to support the increasing number of engineers who are frequently participating in open source communities. Several employees work full-time on open source code, a higher bar to clear at Bloomberg, as employees generally must justify to their managers that full-time work on a community project delivers clear value and utility to the company.

The pace of release of significant open source projects has recently accelerated at Bloomberg, often driven by its active approach to build multi-organization collaborations that share the work and generate more momentum. Wright told us:

A lot of us understand that publishing code as open source is not turning a code switch and saying, "Hey, we are done here." Doing this in a responsible and meaningful way is helping to create and support a community and making the code accessible to others. We always want to act in a responsible and supportive way that makes it useful to others.¹⁴

Comcast

ABOUT OPEN SOURCE AT COMCAST

Comcast is a global media and technology company that has embraced open source across its organization. Comcast uses open source to help build some of the primary infrastructure services that powers its products and services. Comcast understands the power of global open source collaboration and innovation and it is a vital tool for working on its customer experience and to attract the best talent to the company. The company has thousands of technologists, many of whom touch open source as part of their development workflow. Comcast has contributed some major open source projects to the open source community, including the Apache Traffic Control, a large-scale content delivery network solution in production at Comcast to deliver last-mile content to customers.

Beyond using open source in its products, Comcast contributes actively to, and sponsors, open source foundations and communities including the Linux Foundation, the OpenStack Foundation, the Apache Foundation, the Innersource Commons, and the Internet Engineering Task Force. Comcast encourages its software engineers to contribute back to open source projects and to upstream changes they make to open source they consume. Comcast supports the collective development ethos underlying open source ecosystems.

THE COMCAST OSPO JOURNEY

Comcast's involvement in open source officially began in 2006, when a software developer made a patch contribution to Apache HTTP and demonstrated that fixing a project upstream was easier than maintaining patches at the consumption level. The first stage of formal consumption and compliance of the OSPO maturity cycle at Comcast started years ago, when more formal policies and processes were put in place by some legal and development leaders to address the increasing consumption and contribution.

Comcast moved to the contribution stage of the OSPO maturity cycle soon after, when company developers began to contribute code to open source projects and Comcast established an Open Source Advisory Council. To properly measure impact on open source, Comcast began tracking contributions in 2013. In the very first year, the company's employees tallied 13 contributions. Comcast entered its next phase of the maturity cycle a few years later, when the company began to incubate and release projects to the public, starting with Apache Traffic Control. Since then, Comcast has not only contributed to several projects used by the company, but has also posted dozens of open source repositories on GitHub and released multiple projects.

As open source became more important to Comcast's business and technology strategies, the company recognized it needed to

¹⁴ Alyssa Wright (OSPO, Bloomberg), Zoom interview with author, Sept. 24, 2021.

move to a more mature stage, one of collaboration and community leadership, to build a cohesive internal and external open source strategy. Nithya Ruff, who is a Comcast fellow and the head of open source at Comcast from 2017 on and serves as board chair of the Linux Foundation, was hired to help drive open source engagement across the company. "The company wanted to make sure that we had a single place which would drive open source engagement and compliance across the organization.

The job description of the OSPO at Comcast needed to be broader than compliance and needed to include continued fostering of code contributions back to the community," says Ruff. "We also needed to enhance our developer relations practice, to grow our community engagement with the leading foundations and ecosystems."¹⁵

Since inception, there have been two primary goals of the Comcast OSPO. The first goal is to make it as frictionless as possible for Comcast developers to consume, contribute, comply with, work on, and create open source. The second goal is to be supportive and engaged with the broad open source community by giving back, actively engaging with it, and helping the community innovate faster. This also helps Comcast attract and retain talented open source developers into the company. Notes Ruff, "A lot of our engineers love being able to contribute to OSS, and being able to speak at conferences, and publish papers and blogs. Our job is to make it easy to make it work in OSS. We believe OSS is a critical component of innovation as a company and a key advantage in attracting great developers to work with us."

To fulfill those goals and more, Comcast developed what it calls the "6 Cs Strategy" for its open source practice. Those Cs are "communications, consumption, contribution, collaboration, compliance and culture, all key attributes of developing in the open and building healthy open source ecosystems. The Cs inform Comcast

open source practices, from working with other companies in the TODO Group and OpenChain to participating and sponsoring open source foundations, to creating an internal mindset and culture of open source. For example, to become more collaborative, Comcast joined the Linux and Apache Foundations and began to seek leadership roles in those bodies and to attend more events. Comcast took an inventory of OSS usage and dependencies early in starting the OSPO to understand better where the dependencies were and communities to support and work with. "That inventory guided us to where we should be spending our resources for collaboration and contributions," says Ruff.

Over time, the OSPO practice at Comcast is evolving to become both more proactive and more strategic. As the office has grown, the Comcast open source team has branched out into new areas, creating an internal open source ambassador program to scale education about open source best practices and creating an inner source practice to share development burdens across multiple business units. The Comcast OSPO also collects detailed metrics on the impact of open source and inner source efforts including contributions processed and type of contributions, events (sponsored, attended, internal, user groups, etc.), blog and article publications, compliance automations, and consultations.

Today, the Comcast OSPO has grown to become an internal center of excellence and consultancy for all-things open source. Explains Ruff, "Our business units now come to us with ideas and say, 'Hey, here's what we want to do. Can you help make this happen? How do we put this in a foundation? Are there processes or best practices?'" Recently, the OSPO guided the Trickster and Kuberhealthy maintainers toward contributing the projects to the Cloud Native Computing Foundation. "With those projects, we discovered that many other major companies also found these projects useful and were getting actively involved in the project. It was exciting to see

¹⁵ Nithya Ruff (OSPO, Comcast), Zoom interview with author, Sept. 20, 2021.

other companies blogging about their use of Kuberhealthy and how it had helped them. This helped us build a business case to the CNCF that these two projects have enough traction that they should be added to the Foundation's sandbox."

The Comcast OSPO has a valuable role to play to guide the organization on technology trends, changing license and open source directions, and best practices. "When things change, like license changes or unexpected end of life (EOL) of products, we advise teams on what to do and how to react," says Ruff.

"My vision is to be strategic to the company as an OSPO and enable the business to better achieve its goals through OSS. Today, we are very strategic in the way we do OSS," says Ruff. "From business model to ecosystem building to determining what we can build and who we can collaborate with, I believe, OSPOs have a lot to offer."

Porsche

OPEN SOURCE IN AUTOMOTIVE

The storied automaker is driving rapidly toward an open source future. Part of the Volkswagen Group, Porsche uses OSS software primarily for embedded systems, such as electronic control units, and for consumer-facing mobile applications. Spurred by the rapid growth of Tesla and its software-first automotive technology development approach, Volkswagen has created a number of initiatives to accelerate the internal creation of software, as well as participation in open source communities and projects. As part of this effort, Porsche created its own OSPO in 2020. The group now claims 12 FTEs operating in multiple product groups across the automotive firm.

PORSCHE'S OSPO JOURNEY

Historically, Porsche has consumed OSS for niche capabilities. Prior to 2018, the firm focused on ensuring that engineers who chose to use open source did so in a compliant manner. While open source usage did undergo legal review, each product group had its own compliance process and coordination.

The company recognized that a unified open source compliance and license strategy would serve it better, as would one set of tooling to simplify compliance.

"We always had a compliance program. At one point we decided that because we do consume a lot of open source, we needed an overarching cross-functional team," said Nik Peters, head of the OSPO at Porsche. "We didn't want to rely on product teams, but rather on a central point of contact for technical, legal, and other questions."¹⁶

Beyond compliance, Porsche recognized that its future lay in embracing open source to iterate and innovate more quickly, and drive products to market faster. "It was clear that staying only with license compliance would not be enough. We needed to drive contributions to OSS, create inner sourcing programs, and make sure our OSS was secure," Peters explained.

More than many companies, Volkswagen (VW) is aggressively pushing to foster open source, creating entirely separate companies that focus on software innovation for the automotive industry. The company wants to reduce its reliance on suppliers for software to power components and increase internal development. To that end, VW set up [CARIAD](#) as a standalone business to create software for all the brands of the conglomerate and pool resources. CARIAD is closely involved with the OSPO efforts at Porsche and other Volkswagen Group companies. At the same time, Porsche and VW wanted to improve their approach to technology development through greater collaboration.

16 Nik Peters (Head, OSPO, Porsche), Zoom interview with author, November 11, 2021

Peters started the pre-OSPO effort in 2018 with the launch of a formal OSPO in 2020. He organized Porsche's OSPO around the concept of "coordinators" who sit inside product teams but report to the OSPO. During those early days, Peters and other Porsche OSS leaders spent time talking to leading software and technology companies with long open source track records, such as SAP, to learn about how they handled and nurtured open source. Initially composed of just Peters and one colleague, the Porsche OSPO has since grown to 12 FTEs, with a roadmap for backing and funding from upper-level management. Peters himself reports to the Porsche CTO. In 2020, Porsche officially launched its OSPO. Today all OSS compliance and approvals run through the OSPO.

Even from inception, the group's vision of creating a Porsche open source ecosystem involved grander and more holistic goals, including:

- Improving Porsche's reputation as a software organization in the open source development community
- Reducing time to market of products and innovation through open source
- Reducing costs of software development
- Fostering greater collaboration with industry and other technology leaders
- Improving software quality and security
- Attracting and retaining high quality employees

Since 2020, Porsche's OSPO has rapidly expanded its participation in open source. "Today, we rely on other companies and other development efforts, so much so that we plan our internal

releases based on what those groups are doing," said Peters. "It has evolved tremendously from joining mailing lists and Slack [channels] to driving new open source initiatives."

For example, Porsche has collaborated with numerous industry players to work on the [OSS Review Toolkit](#), a tool chain and set of pipelines that automate and standardize compliance and reporting of OSS. Porsche is working with developers from Bosch, Here Technologies, and other automotive industry players and software companies in the European Union. The company has also stepped up promotion of its open source efforts in the media and through code school sponsorships, where Peters frequently gives keynote addresses.

To be fair, Peters feels that Porsche has made great improvements but has a long way to go. Porsche developers are participants but not yet heavy contributors. The company does monitor contributions and is looking to install metrics around OSS participation as part of the OSPO's management objectives. "As an organization, we are in between being a contributor but still more being a participant. One of our big goals is to see if we can drive and set open standards—for example, an automotive open source standard," says Peters. Make no mistake—the need for speed is driving Porsche's OSPO. Peters pointed out that, while the average car has dozens of electronic control units (ECUs), each with a different bit of software, cars made by Tesla have only two ECUs. This enables Tesla to treat feature development as more of a software problem. "Our big goal is to move from 10–20% in-house embedded software to at least 60% over five years. This for us is a game changer," Peters said. To hit that goal, Porsche will need all the boost it can get from open source.

Conclusion: The Future of the OSPO

As the world shifts from proprietary software and toward open source everywhere, the role of the OSPO will grow in importance. In our interviews with OSPO leaders, we saw universal expansion of the role of OSPO, budgets for OSPOs, and staff dedicated to promoting open source at organizations. Clearly, open source has ascended from a method and a mindset for building technology products and infrastructure to a means of attracting top talent and achieving business goals. This parallels the digital transformation of society.

In a world where software has eaten everything else, and organizations large and small strongly prefer OSS, expertise on open source becomes integral to creating great products and product experiences, be it at the product layer (media, communications) or in the infrastructure that supports the product. The OSPO is growing to fill these new larger shoes, serving as an internal consultancy, a center of excellence, and a trusted advisor and mentor. Such growth is not without growing pains. Demand for

open source and OSPO services appears to outstrip supply, and more mature OSPOs are developing scaling processes and capabilities to serve a broader user base inside these organizations. Furthermore, OSPOs are more than just for the tech industry; we are seeing OSPOs being established within academia and governments to help with software procurement and innovation.

That said, our conversations with OSPO leaders and the survey responses indicate that, if anything, organizations are planning to expand OSPO budgets and mandates, mirroring the growth of open source. OSPOs will have more resources available to automate OSPO manual tasks (in areas like compliance or due diligence) and larger OSPO teams to meet the needs of developers who spend more time in open source. The expectation of a successful OSPO will transition from educating developers or marshaling code contributions to adding meaningful strategic value and driving higher level open source strategy, innovation, and developer efficiency.

OSPO Checklist

Stage 1

- Define program branding (e.g., OSPO, open source initiative, head of open source operations)
- Manage legal risk and licenses, creating new procedures and documentation to ensure employees use OSS according to its license terms and that the organization's OSS consumption is not putting it at legal risk
- Create education programs to help developers decide when to use OSS in creating new products or services
- Set up specific software inventory processes to create an organization-wide software bill of materials (SBOM)
- Overall, recognize the value of OSS and the need for compliance, education, and an SBOMs

Stage 2

- Lay out best practices in interacting with OSS projects such as how to request features, file bug reports, and contribute basic code
- Communicate to employees and managers the importance of contributing to and not merely consuming OSS (including advocating for and driving event sponsorships, booking project leads and maintainers as speakers or panelists in public coding forums, and securing organizational resources to mission-critical OSS projects)
- Incentivize developers to work on OSS projects critical to their operations, to the degree that developers become highly active contributors or primary maintainers

Stage 3

- Initiate and host, or act as primary sponsors of, OSS projects
- Create and launch open source projects to establish broad credibility in the open source community
- Dedicate one or more full-time employee(s) to a project, and accept responsibility for nurturing a project community and ensuring its health
- Develop internal processes, playbooks, checklists, tooling, and other mechanisms to vet, organize, and operate open source projects and to prepare and coach their leaders

Stage 4

- Become a strategic partner for technology decisions, helping to guide choices and shape long-term commitments to projects
- Advise the CTO and technology leadership on which open source technologies to adopt or remove from the organization's technology stack
- Take the lead on benchmarking what constitutes an acceptable OSS project
- Help organizations understand and navigate project politics




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