THE LINUX FOUNDATION | Research

A Deep Dive Into Open Source Program Offices

Structure, Roles, Responsibilities, and Challenges

August 2022

Ibrahim Haddad, Ph.D.
Vice President of Strategic Programs, *Linux Foundation*
and General Manager, *LF AI & Data*

With a foreword by Chris Aniszczyk,
Chief Technology Officer, *Linux Foundation*
and Co-Founder, *TODO Group*

In partnership with:

LF AI & DATA

TODO

Contents

Foreword

If you're like most corporate leaders, you're likely to be familiar with open source and may even already have an open source program in place. But what exactly is an Open Source Program Office (OSPO), what roles and responsibilities does it have, and how can it contribute to your organization's success?

An OSPO is a corporate entity that is responsible for managing and coordinating an organization's open source activities. The OSPO can be seen as the central nervous system for an organization's open source strategy, and it provides governance, oversight, and support for all things related to open source.

At The Linux Foundation, we view OSPOs as critical components of successful organizations. We've seen firsthand how an effective OSPO can help an organization achieve its business goals and objectives by leveraging the power of open source. The TODO can help you set up an OSPO or take your existing program to the next level.

The TODO Group is a group of organizations that are committed to building the best practices and tools for managing successful open source programs. We are the leading voice on all things related to open source program management, with a growing community of practice that includes some of the world's largest organizations. We encourage you as a practice leader, or someone who is thinking about setting up an OSPO, to join us.

This paper is an introduction to setting up an OSPO. It covers the what, why, and how of open source program management, with a focus on the role of an OSPO and the benefits. It also includes descriptions of various structural models for OSPOs and provides tips and best practices for success. We hope that you find it helpful as you embark on your open source journey.

Chris Aniszczyk
CTO, The Linux Foundation
Co-Founder, The TODO Group

WHAT IS AN OSPO?

OSPO is designed to be **the center of competency for an organization's open source operations and structure.**

OSPOS IN THE ORGANIZATION

OSPOs may exist **unofficially; virtually; within research and development (R&D), engineering, or other corporate departments; or in executive-level offices of the Chief Technology Officer (CTO) or Chief Legal Officer.**

OSPO BENEFITS: PROCESSES

OSPOs oversee the establishment or adaptation of internal policies to **better manage open source software (OSS) compliance in fast-moving, dynamic environments.**

WHY FORM AN OSPO?

Organizations across industries establish OSPOs to **drive OSS leadership and gain a critical foothold in a robust, external R&D ecosystem.**

OSPO STAFF

OSPOs can be run by any distinguished individuals with **strong sets of skills, such as software architects, technical evangelists, compliance engineers, and legal counsel.**

OSPO BENEFITS: TOOLS

OSPOs help to implement unique and flexible sets of tools that support OSS development models **while meeting corporate Information Technology guidelines.**

CHARACTERISTICS OF OSPO MATURITY

Mature OSPOs **oversee OSS consumption, governance, strategy, contribution, processes, and tooling.**

OSPO RESPONSIBILITIES

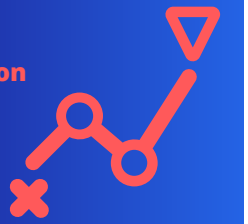
The OSPO assumes different responsibilities that change over time, including **developing and executing the open source (OS) strategy, setting priorities, tracking performance, and leading community engagement.**

OSPO BENEFITS: CONTINUITY

As organizational needs or strategies evolve, **OSPOs enable continuity in executive support, funding, software development practices, and OSS project prioritization.**

OSPO MATURITY MODEL

OSPO maturity evolves in the following stages: **ad-hoc adoption -> legal motivations -> community-driven -> engagement-driven -> leadership-driven.**



OSPO BENEFITS: CULTURE

OSPOs help to bridge the cultural gap between **traditional software development practices and the requirements of open source development.**

OSPO BENEFITS: EDUCATION

OSPOs improve **technical, mentorship, and compliance-related education and training programming for team members across all levels of the organization.**

Abstract

Open source projects and initiatives provide enterprises with proven, successful models to collaborate with other organizations, create new technologies, and support the development of new communities. Organizations across many industries are establishing Open Source Program Offices (OSPOs) and staffing them with highly skilled individuals to drive open source software(OSS) leadership and gain a critical foothold in this external research and development (R&D) ecosystem.

This report examines how enterprises structure their OSPOs and the required minimal staffing needed for their operation, discusses the responsibilities of such offices, and elaborates on the challenges that are faced in open source enterprise adoption.

Introduction

The availability of open source software (OSS) is changing how organizations develop and deliver products. The combination of a transparent development community and access to public source code enables organizations to think differently about how they procure, implement, test, deploy, and maintain software (**FIGURE 1**). OSS has created an ecosystem with a wealth of benefits for all those involved. Organizations of all types, across all industries and domains, are racing to build and grow their open source operations under an Open Source Program Office (OSPO) to help them use and contribute to open source more efficiently and effectively and benefit from its strategic impact (**FIGURE 2**).

OSS allows shared development and lowers research and development (R&D) costs by enabling organizations to reap the benefit of billions of dollars of OSS, which they can harness to create better products and services. In addition, it helps to accelerate product development and enables a faster time to market by aligning business needs with upstream open source projects. Organizations do not get involved in open source projects because it is fun; they do it because it is a part of their business or product strategy. OSPOs often manage and orchestrate that involvement.

The first step in establishing an OSPO is understanding that open source is key to mastering software engineering, as almost every software product that exists today relies on OSS. Leading organizations in a growing number of industries have established their position by becoming leaders in software development, and OSS is a critical component of this leadership. The second step is the availability of an executive sponsor within the organization who will support the

FIGURE 1

Open source is a technology market accelerant

FIGURE 2

Strategic impact of OSS

- Accelerate the development of open solutions
- Provide an implementation to an open standard

- Commoditize a market
- Reduce prices of nonstrategic software assets
- Share development costs

- Drive demand by building an ecosystem for products & services

- Partner with others
- Engage customers
- Strengthen relationships with common goals

establishment of an OSPO, provide funding for it, and offer a long-term commitment to improving and growing open source engineering in the organization. This person also plays a critical role in identifying a trusted open source leader who can create and develop the OSPO.

OSPO Definition

An OSPO is designed to do the following: (1) be the center of competency for an organization's open source operations and structure and (2) place a strategy and set of policies on top of an organization's open source efforts. This can include setting code use, distribution, selection, auditing, and other policies; training developers; ensuring legal compliance; and promoting and building community engagement to benefit the organization strategically. See the OSPO definition by the TODO for more information.

OSPO Characteristics

To a certain degree, an organization calling itself an OSPO indicates that the organization has reached a mature stage, gained critical mass support with its enterprise, and manifests the following five key characteristics:

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

OSPO Maturity Model

To better explain the evolution of OSPOs, the TODO Group has developed a model (**FIGURE 3**) to assist organizations in determining their OSPO and identifying the elements that need to be implemented to advance the maturity of their OSPO. This model is composed of the following two variables and five stages:

MODEL VARIABLES:

- Y variable: Ability to execute.
- X variable: OSPO level.

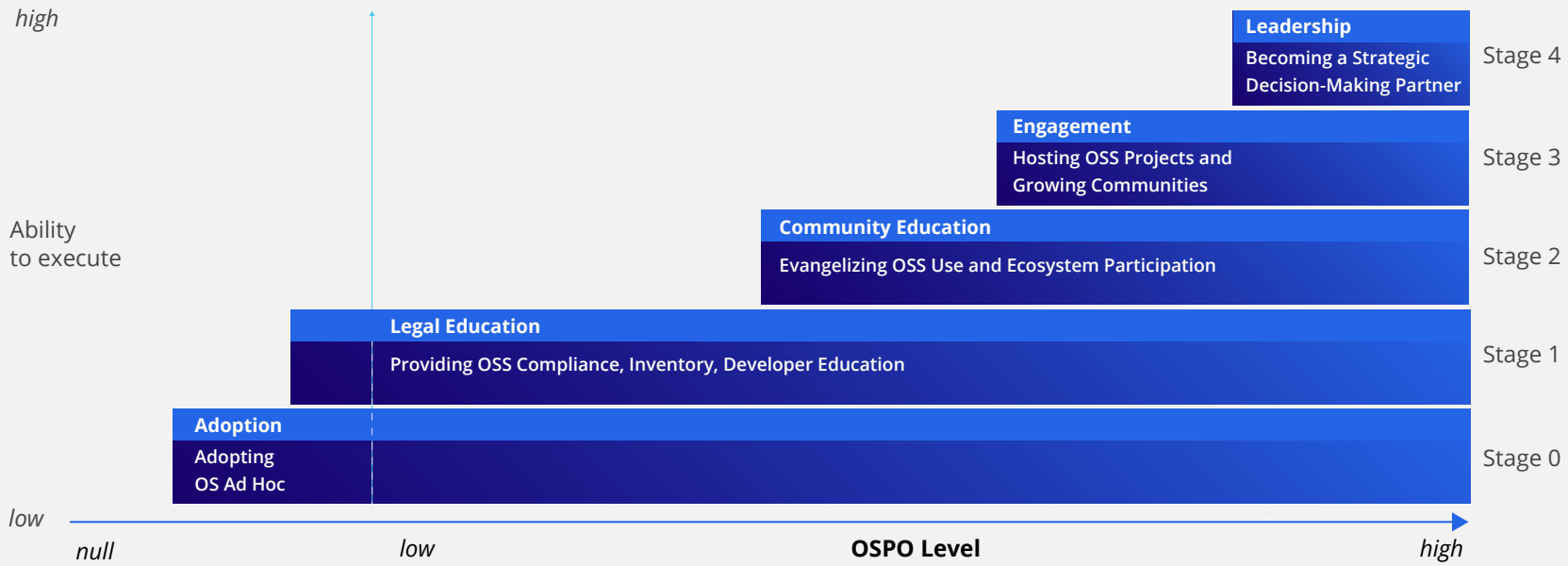
MODEL STAGES:

- Stage 0: Ad-hoc adoption.
- Stage 1: Legal-driven.
- Stage 2: Community-driven.
- Stage 3: Engagement-driven.
- Stage 4: Leadership-driven.

FIGURE 3

Maturity stages of OSPOs

Source: TODO Group



Stage 0: Ad-Hoc Approach

Nowadays, almost all organizations use OSS, although how they adapt and initially use it varies. They may use OSS as a building block or library in a product or tool, a key part of a vendor's solution stack, or in support of their service offering. Modern cloud native applications, almost by default, use open source systems for container orchestration, observability, data storage, messaging, and more. In other words, nearly every organization is using open source. However, the earliest form of adoption is ad hoc due to developers solving problems using readily available tools and technologies. This "ad-hoc adoption" usually means that little thought is given to license compliance outside the basic defaults or to the longer-term impacts of consuming OSS and distributing products that are built with OSS components.

Stage 1: Legal-Driven Adoption

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 rather than part of its products or services to its customers or users. At this early stage, organizations often use many different names for the OSPO. For example, IBM initially called its programmatic open source efforts the "Open Source Steering Committee."

Organizations in Stage 1 recognize that OSS is a key part of their business and technology strategies. They understand that the security practices of OSS projects differ from those of proprietary software organizations.

Organizations must identify their legal and security risks. The risk mitigation strategies include the following:

- Compliant licensing.
- Developer education.
- Inventory-tracking.

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 rather than part of its products or services to its customers or users.

Stage 2: Community-Driven Adoption

EARLY STAGE

After organizations recognize the value of OSS and the need for compliance, education, and a Software Bill of Materials (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 the usage of approved OSS products, educational programs on good OSS hygiene, and technical training or tuition reimbursement for OSS skill building and certification. With these initiatives, an organization can grow its use of OSS and amplify its message that OSS is not only important but also desirable and preferable to proprietary software.

GROWTH STAGE

When advancing in this stage, organizations begin encouraging their developers to work on OSS projects that are critical to their operations to the extent that the developers become highly active contributors or primary maintainers. During this stage, OSPOs begin to streamline and optimize open outbound source contributions for their developers and create and launch open source projects to establish broad credibility in the open source community.

Stage 3: Engagement-Driven Adoption

During Stage 3, organizations initiate and host or act as primary sponsors of OSS projects. They will dedicate one or more full-time employees to a project, and they accept responsibility for nurturing a project community and ensuring its health. They do not confuse this level of organizational commitment with individual employees who decide to open source their projects. Additionally, during this stage, organizational leaders support incubating and launching OSS projects into the public sphere because they understand how these projects benefit their organization. Such projects tend to offer improved performance and economics on crucial capabilities that may be noncore to the organization's value proposition but critical to its technology infrastructure.

Additionally, during this stage, the OSPO develops several mechanisms to vet, organize, and operate open source projects and prepare and coach their leaders, such as the following:

- Internal processes.
- Playbooks.
- Checklists.
- Tooling.

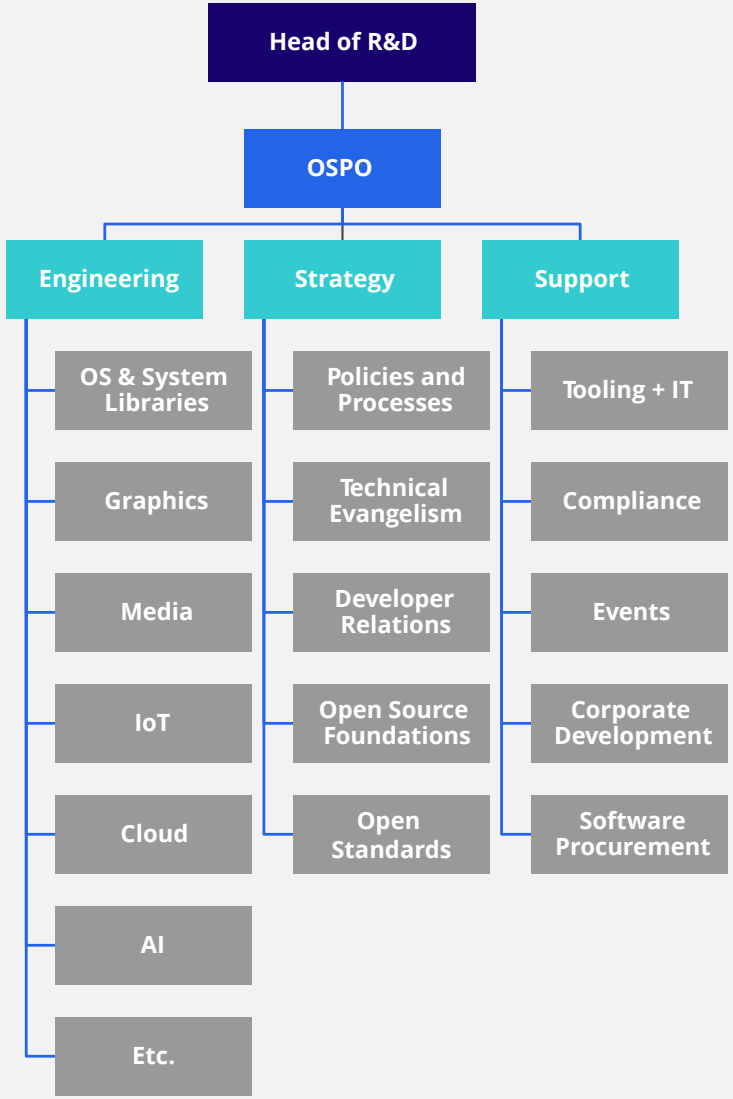
Stage 4: Leadership-Driven Adoption

During this maturity stage, the OSPO becomes a strategic partner for technology decisions, guides choices, and shapes long-term commitments to projects. Additionally, the Chief Technology Officer (CTO) and other technology leaders consult the OSPO and its leadership on which open source technologies to rely 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 both upstream and downstream technologies and hiring plans, the choice of open source projects becomes a major business decision. The following three main types of strategic guidance take shape in this final stage:

1. Advise the CTO and technology leadership on open source technologies to adopt/remove from the organization's technology stack.
2. Take the lead on benchmarking what constitutes an acceptable OSS project.
3. Help organizations understand and navigate project politics.

FIGURE 4

OSPO structured within an R&D organization



OSPO Structure

In this section, we explore common OSPO structures. It is important to keep in mind that no two organizations are the same. Therefore, there are no cookie-cutter OSPO structures. Instead, many organizations, including those with a long record of open source involvement, experiment with different setups. Generally, an organization's goal is to find the most suitable and efficient structure based upon its overall software strategy, open source aspirations, reliance on OSS in products, unfilled positions in open source, and other factors.

Example 1: OSPO Within an R&D Department

A common placement for an OSPO is within an R&D organization. For instance, the author of this paper adopted this model (**FIGURE 4**) when he was hired by Samsung in early 2013 to establish Samsung's Open Source Group. In this example, the open source leader owns open source engineering, and the strategy and support functions, and reports directly to the head of R&D. The Samsung OSPO has a dedicated budget to cover the head count, travel, and sponsorship costs for open source events, membership dues for open source foundations, hardware and software expenses, and various other miscellaneous expenses (including promotional items, such as tee shirts, hats, etc.). This specific setup has worked very well for many years.

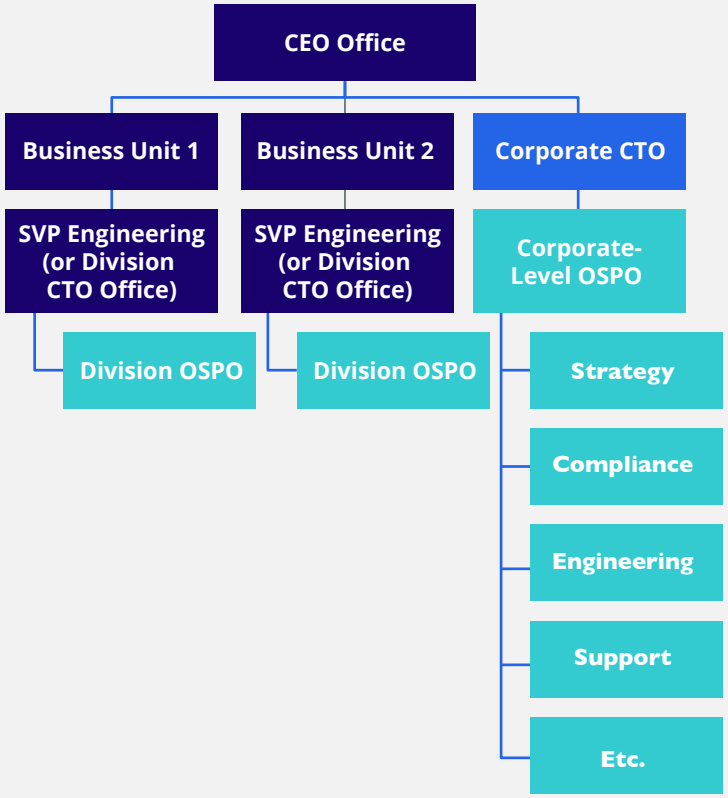
There are two main reasons to structure the OSPO under an R&D function (or department). The first is to isolate the group from product divisions, thereby preventing it from becoming an auxiliary development arm for those divisions. This setup allows the OSPO to maintain a certain level of independence, both financially and in terms of projects, so it can focus on open source technologies of the highest priority without being influenced by any product division. The second reason to structure an OSPO within R&D is to better support efforts that involve external parties, such as other organizations and universities, away from daily product pressures.

Example 2: Corporate-Level OSPO With Supporting Division-Level OSPOs

This model (**FIGURE 5**) works best in large organizations with multiple product divisions. It consists of a corporate-level OSPO, which coordinates the activity of multiple supporting OSPOs at the division level. The corporate OSPO is responsible for establishing organization-wide policies and processes, deciding on the strategy, working with open source foundations, driving major open source initiatives, and managing open source matters at the corporate level in general.

FIGURE 5

Corporate-level OSPO with supporting division-level OSPOs



The supporting OSPOs are responsible for executing the open source strategy at the division level, ensuring staff follows the corporate policies and processes, delivering training, and in many cases, managing upstream open source engineering. The corporate OSPO may not have any engineering resources, except for a principal engineer or a senior architect, to provide technical expertise and leadership.

Example 3: OSPO as Part of the CTO Office or Engineering Department

In medium-sized organizations, it is common to house the OSPO either within the engineering department or under the CTO office. This OSPO structure typically has a dedicated budget that is managed by the executive sponsor (Sr. Vice President of Engineering or the CTO). Although the OSPO may have its own budget, all spending and any external commitments require the approval of the executive sponsor. The OSPO might have dedicated engineering resources that work on upstream projects depending on the organization's needs. **FIGURE 6** illustrates these two scenarios.

FIGURE 6

OSPO as part of the engineering department or the CTO office (with dedicated open source developers)

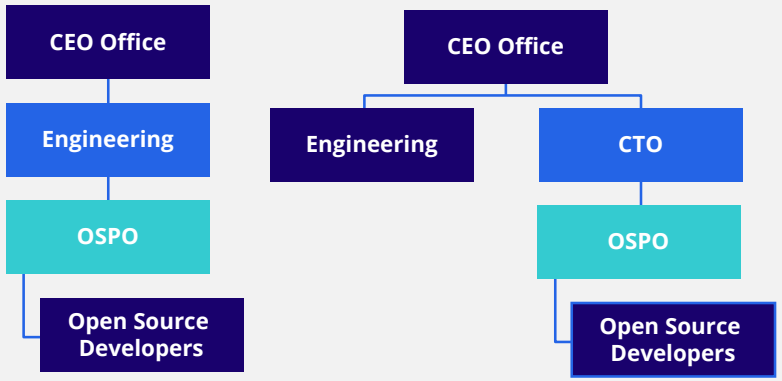
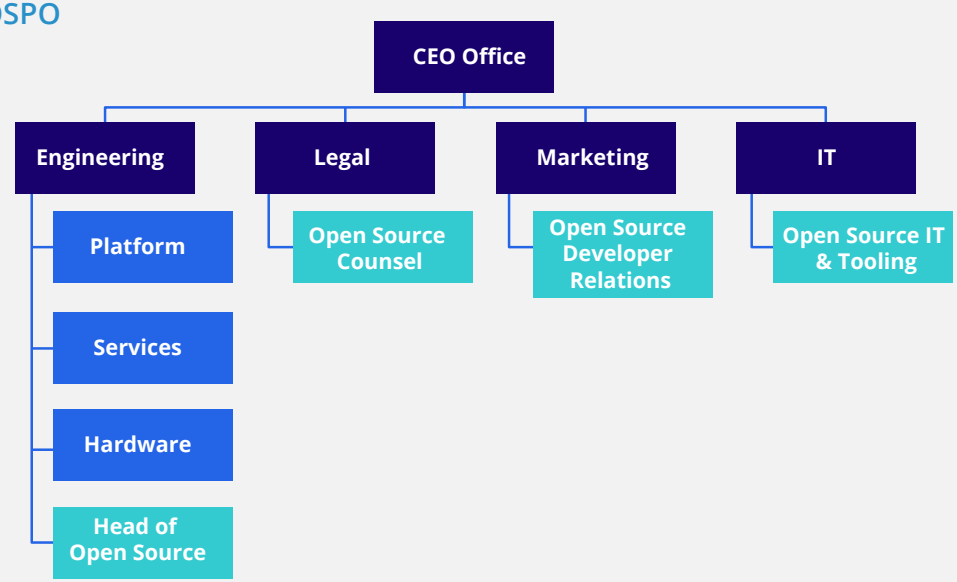


FIGURE 7

Virtual OSPO



Example 4: Virtual OSPO

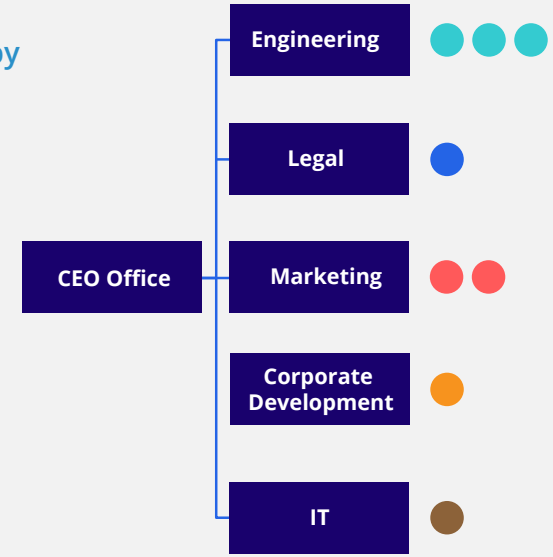
The virtual OSPO (**FIGURE 7**) is a common setup in an organization that has a head of open source, which is typically within the engineering department, without any dedicated staff. The head of open source works with a virtual OSPO staff comprising individuals from different teams, such as legal, engineering, and marketing, each of whom dedicates a certain percentage of their time to support open source activities. A virtual OSPO does not typically have a dedicated budget; instead, the budget for any open source spending would come from the engineering department or CTO office.

Example 5: No Official OSPO

This example (**FIGURE 8**) is of an organization that does not have an official OSPO. This is a typical setup in smaller organizations and start-ups where different individuals fulfill the duties that are associated with an OSPO. Although this structure provides more flexibility for smaller organizations, it is difficult to scale as the organization grows.

FIGURE 8

Individuals (represented by colored circles) fulfill the duties of an OSPO in a smaller organization



Staffing an OSPO

The staffing of an OSPO depends on many variables. However, several roles are required, regardless of the specific structure of any given OSPO. These roles do not have to be distinct positions. In some cases, distinguished individuals with strong sets of skills can fulfill more than one role.

Head of OSPO

The head of the OSPO is often called the director or vice president of open source, depending on the size of the organization and the open source team. The head of open source is responsible for managing and executing organization-wide open source strategies and business metrics to track the business and technical success of the program. Depending on the structure of the OSPO, the office leader could also be responsible for open source engineering resources, ensuring open source compliance, representing the organization among open source organizations, and participating in open standards efforts.

This individual should possess the following traits:

- A strong engineering background and experience in software development.
- Contacts with open source organizations.
- A comprehensive understanding of open source licenses.
- Knowledge of industry best practices.
- Knowledge and experience in establishing corporate-wide policies and processes.
- Technical knowledge related to the organization's products and services.
- Historical perspective of open source.
- Knowledge of how various technical project communities operate.

The TODO Group has published a template job specification for this role that you can customize to your needs.

Software Architect

We believe that it is mandatory for an OSPO to have a senior software architect or principal engineer to act as a high-level technical decision-maker on topics that are related to OSS: from design choices to technical standards, such as platforms and coding standards.

Technical Evangelist

A technical evangelist is an individual with a strong technical background whose primary role is to evangelize the open source contributions and solutions that are developed by the open source group to the organization's customers, prospects, and partners, and the open source community in general. They are responsible for running demonstrations at events, delivering technical presentations, creating documentation, and generally building support to a critical mass for a given technology.

Compliance Engineer

The compliance engineer supports the execution of the organization's compliance policy and process and ensures that the organization fulfills all license obligations for the OSS that is used in its products and services. Some OSPOs have complete ownership of the open source compliance function; in these cases, the OSPO may need to host multiple compliance engineers.

Legal Counsel

It is rare for an OSPO to have legal counsel among its staff. In most cases, having access to a legal counsel that is versed in open source licensing is sufficient for small and medium-sized organizations.

OSPO Responsibilities

The OSPO assumes different responsibilities that change over time. In the following subsections, we explore these responsibilities and discuss them at length. You can also explore these responsibilities in this interactive OSPO mind map.

Develop and Execute an Open Source Strategy

Since the beginning of the software industry, nearly every software organization has followed the same business model as follows: source code was developed by its employees or licensed from a third party, intellectual property was closely held, and software was delivered in a binary format to its clients. However, the availability of enterprise-grade OSS is changing how organizations develop and deliver products. With open access to source code and transparent development communities, software providers can reduce development costs while remaining active participants in the development process. In addition, end users of the software can also be active in the development process by contributing directly to upstream projects rather than be passive recipients of what the software vendor delivers to them. This development model enables organizations to think differently about how they procure, implement, test, deploy, and maintain software. In this report, we explore the following four basic strategies for organizations that utilize and integrate OSS in their products: consumer, participant, contributor, and leader.

FIGURE 9

The four core stages of open source strategy—consumer, participant, contributor, and leader

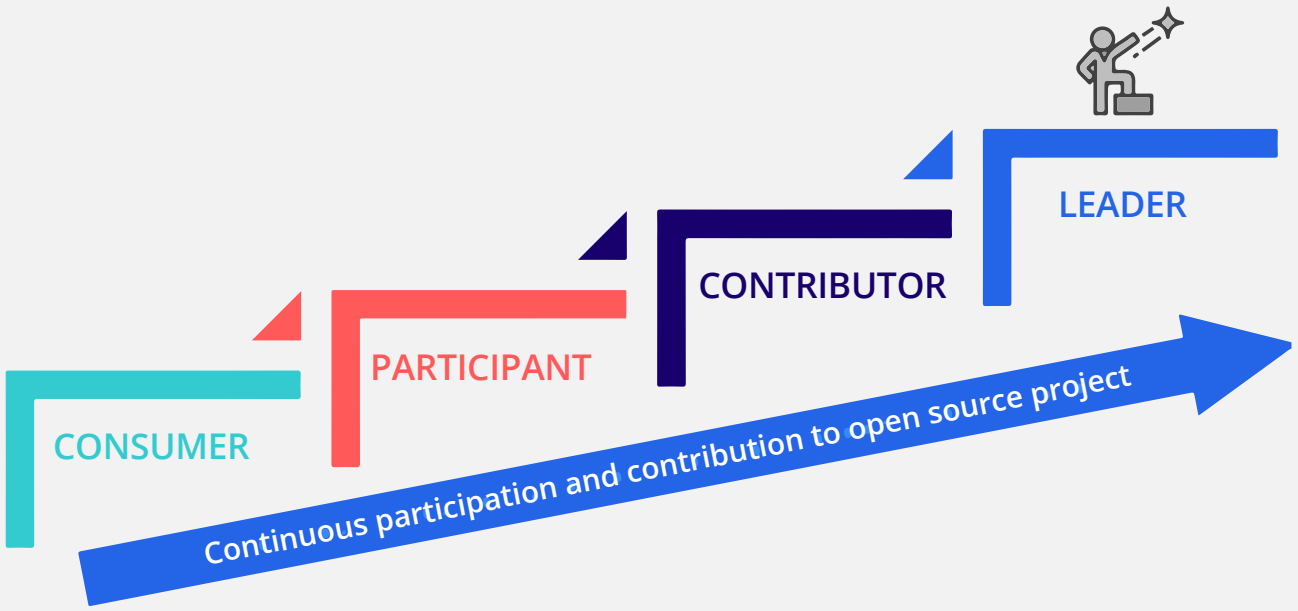


FIGURE 9 illustrates the following four primary OSS strategies: consumption, participation, contribution, and leadership. Each strategy requires organizations to be successful at the previous strategy. How far your organization advances up this ladder is entirely dependent upon its objectives and overall open source strategy.

These four strategies overlap as organizations transition from one position into another. Typically, the early stages are engineering-driven due to engineers using open source components in product development. Initially, their participation in strategic projects may be limited to joining the conversation or making small contributions. Over time, this usage can grow within the organization and become part of the business strategy as it gains traction.

Some organizations can achieve their goals simply by being consumers of open source code and are content to stay at that level, while others have ambitions to attain certain leadership positions. As it is likely that your organization is already at one of these levels of the ladder, it is important to identify both your current position on the ladder and your target position.

Consumer Scenario

The common starting point is the adoption of OSS and integration of OSS in products and services. Voraciously consuming open source components will increase your ability to differentiate products and services and reduce your overall time and costs in delivering those products and services. The following action items are essential to this strategy:

- Set up an open source review board to serve as a clearinghouse for all open source activities, including license compliance.
- Use a strategic classification scheme to guide decisions on what OSS to consume.
- Create an inventory of all software that is used via SBOM to enable a more granular view of the licenses of the OSS in use to determine whether the enterprise is complying with all license obligations and identify any known security vulnerabilities.
- Deploy automated workflow software for evaluating/approving open source usage.
- Create a plan for incremental investment in head count and infrastructure in engineering, product management, and legal to manage a complex mix of closed and open source software.

Some organizations can achieve their goals simply by being consumers of open source code and are content to stay at that level, while others have ambitions to attain certain leadership positions.

When establishing a software strategy that encourages the use of OSS in commercial products, the following actions can be taken to ensure the successful adoption of OSS:

- Communicate the strategy for the use of OSS.
- Educate staff on open source compliance, license obligations, and the open source development model.
- Establish explicit criteria for determining which OSS is a candidate for inclusion in your products. Examples include the availability of new features, the maturity of the project's source code, the size and composition of the project's development community, and other factors that measure the state of the code and the people who maintain it.
- Establish an open source compliance program to ensure that you have the processes in place to meet the license obligations of the OSS that you are using in your products.

- Encourage your developers to identify and adopt open source development tools that can enable better internal collaboration, increased and transparent team communication, and faster development cycles.
- Encourage your staff to subscribe to open source mailing lists and magazines, follow blogs, and participate in discussion forums.
- Encourage and fund staff's attendance at open source conferences for learning and networking opportunities.
- Join open source industry bodies and foundations, such as The Linux Foundation, for opportunities to share development and legal best practices with other leaders in the industry.
- Hire developers from the open source community.
- Host local open source user groups and encourage your staff to get involved in local open source activities.
- Invite community members to present to your development team on topics that are related to the project.

Participant Scenario

Once your organization is successfully using OSS in products or services, you can expand your strategy to participate in the open source community. Unless you have already hired experienced developers, you may need to engage more closely with the community, increase your visibility, and begin attracting the talent that you need. The following action items are essential to participation:

- Monitor community communication platforms, such as chat servers, mailing lists, forums, and websites, to keep on top of project developments.
- Attend relevant conferences and meetups to establish relationships within the community.
- Sponsor project events and foundations to improve the enterprise's visibility.

Once your organization is successfully using OSS in products or services, you can expand your strategy to participate in the open source community.

Contributor Scenario

Once your enterprise realizes the benefits of participating regularly in the community, you can assess the advantages of contributing code to projects and communities. As code contributors help to shape future features, contributing source code to those open source projects that are critical to your business objectives is the best way to influence those projects and build a positive reputation. The following action items are essential to this scenario:

- Educate your team on community development best practices.
- Actively participate and drive technical discussions on the mailing list, Slack, discussion forums, etc.
- Follow the open source community's established working methods and processes.
- File bug reports and contribute fixes to existing bugs.
- Contribute code to improve or extend functionality.
- Contribute code to implement new features.
- Contribute bug fixes or other security measures
- Contribute to documentation efforts.
- Contribute to testing and integration efforts (e.g., write test code, create test cases).
- Listen to feedback on your contributions and act on it.
- Establish trust with the project maintainer and other project participants via your contributions and active participation.

- Hire a staff director to lead the open source strategy and manage the OSPO.
- Hire contributors and committers to open source communities that are vital to your products and services.
- Deploy open source collaboration tools to support open source usage and contributions.
- Invest incrementally in engineering, product management, and legal resources to engage with external communities.

Leadership Scenario

The highest form of open source strategy is leadership. Open source leaders earn their strategic positions by establishing trust with project members and maintaining a high level of continuous contribution. Leading organizations can capitalize on emerging trends in technology.

This scenario requires significant investment in targeted open source communities and consortia to establish a leadership agenda. In addition, it will require incremental investment primarily in engineering, product management, and legal to establish leadership in external communities and industry consortia. Below are some of the tactical steps that can help steer your organization toward a leadership role within a specific open source project:

Participate actively and openly within all aspects of the project, including planning, development, testing, and release management, thereby demonstrating your capacity to act as a good steward of the project.

- Achieve a higher level of participation and contribution.
  - Engage with the various project participants.
  - Contribute to patching bugs, adding new features, and extending functionality in existing open source projects using the best practices, which are outlined above.
  - Demonstrate good faith by contributing (when relevant) proprietary source code from internal development to open source projects under an appropriate open source license that makes it usable and useful to the community.
- Publicly acknowledge that the organization has achieved tangible benefits by working with open source communities for critical software product development.
- Empower employees to seek maintainer status within the project.
- Sponsor events, provide financial support for project infrastructure, and consider hiring recognized open source developers from within the project.
- Increase participation in relevant open source organizations and foundations.
- Lead architectural and requirement-gathering initiatives within the various communities and consortia to achieve commercial objectives.
- Establish an open source architect role to proactively guide the use of and contributions to OSS.

While there are numerous strategic objectives to choose from, the following objectives are common among organizations that use and develop OSS:

- Reduce development costs.
- Improve the quality and flexibility of products.
- Achieve a faster time to market for products.
- Increase engineering capacity through community engagement.
- Broaden and deepen developer community commitment to your open source efforts.

Oversee Open Source Compliance

Open source initiatives provide organizations with a vehicle to accelerate innovation through collaboration with open source communities. One core responsibility for organizations is their compliance with open source licenses. Open source compliance is the process by which users, integrators, and software developers observe copyright notices and satisfy the license obligations for their OSS components.

Open source compliance helps to achieve the following four main objectives:

- Comply with open source licensing obligations.
- Facilitate effective use of OSS in commercial products and services.
- Comply with third-party software supplier contractual obligations.
- Protect commercial product differentiation.

OSPOs are generally involved in open source compliance in the following two ways:

1. They are responsible for implementing and running a complete end-to-open source compliance program, which includes the policy, process, tools, automation, education, and final fulfillment of obligations for OSS integrated into products, software, or services.

Or

2. They are responsible for establishing the organization's general open source policies, and the execution and enforcement of these policies are pushed into the various divisions across the organization. For instance, ensuring open source compliance is a great example of a scenario where the OSPO is focused on policies and processes, and dedicated teams on the product side are more trusted than the actual implementation and execution of a compliance program.

The OSPO has a direct impact on the full scale of compliance responsibilities. Regardless of the specific role of an OSPO, it must have at least one individual who is very knowledgeable in open source licensing, compliance practices, and engineering.

The minimum set of individuals that represent the core compliance team includes a legal representative, an engineering or product representative, and an open source compliance expert, who is often a member of the OSPO. In the following table, we briefly present the primary roles of these individuals who form the core open source compliance team. For a detailed discussion on the topic of open source compliance, please download the free e-book *Open Source Compliance in the Enterprise*, which was published by The Linux Foundation. The e-book is a practical guide for organizations on how best to use open source code in products and services and legally and responsibly participate in open source communities.

FIGURE 10

Ensuring open source compliance is a cross-functional activity

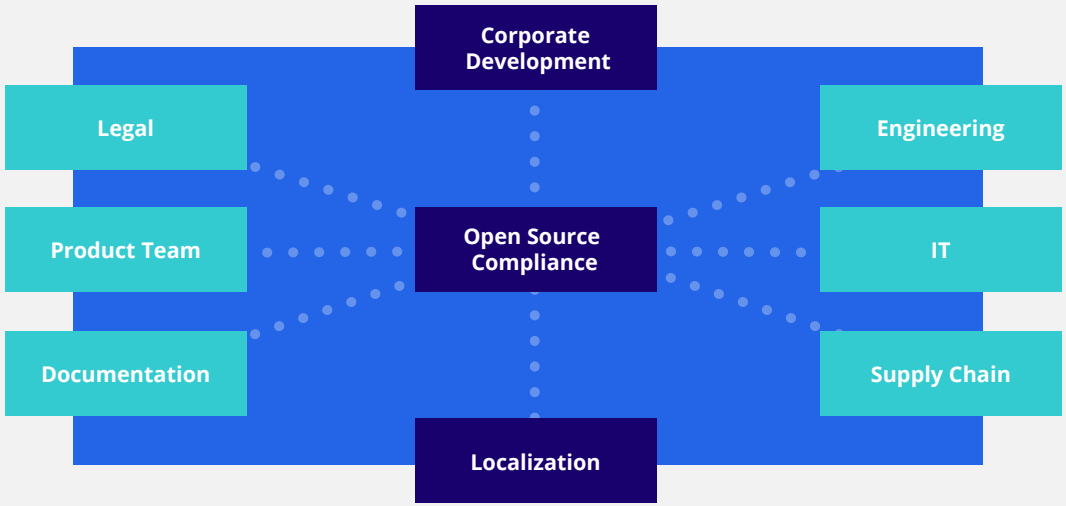


FIGURE 11

Roles and responsibilities of the core compliance team members

CORE OPEN SOURCE COMPLIANCE TEAM	PRIMARY RESPONSIBILITIES
Legal representative This representation varies from a legal counsel to a paralegal, depending on the task at hand.	• Review and approve the use of OSS and the contribution to OSS projects. • Provide guidance on the incoming and outgoing licenses of all software. • Contribute to the creation of open source training. • Contribute to the creation and improvement of the compliance program. • Review and approve the content of license compliance documentation and resources. • Review and approve the list of obligations that are required for each software component that is included in a product.
Engineering and product team representative Some organizations do not distinguish between the engineering and product teams.	• Follow compliance policies and processes. • Integrate compliance practices into the software development process. • Contribute to improving the compliance program. • Follow the technical compliance guidelines. • Respond quickly to all compliance-related questions. • Conduct design, architecture, and code reviews. • Implement security best practices. • Prepare open source packages for distribution.
Compliance representative An open source compliance officer is not necessarily a dedicated resource. In most cases, the individual fulfills the role of the manager or director of open source.	• Drive license compliance activities, such as the execution of source code audits. • Coordinate the distribution of open source packages as part of fulfilling open source license obligations. • Contribute to creating compliance training. • Contribute to improving the compliance program. • Contribute to the creation of new tools to facilitate the automation and discovery of OSS. • Sign off on product release from an open source compliance perspective.

Collectively, these three roles (legal, engineering, and compliance) are responsible for the following three main tasks:

1. Ensuring mutual compliance with third-party software and OSS licenses.
2. Facilitating the usage of and contributions to OSS.
3. Protecting proprietary intellectual property (and product differentiation) by ensuring that open source license obligations do not propagate to proprietary or third-party software.

Establish Open Source Policies and Processes

The policies and processes that the OSPO needs to create depend on the organization's current and target position on the strategy ladder. During the first stage (consumption), the OSPO needs to implement an open source infrastructure that can support the consumption and compliance aspects of OSS. **FIGURE 12** illustrates infrastructure that goes beyond a simple policy to define the organization's guidelines for using OSS. It extends to encompass a strategy that covers usage and compliance, incorporates compliance checkpoints in the development process, establishes a team to supervise the proper usage of open source, provides the necessary training, enables tooling, and facilitates relationships with relevant open source organizations.

FIGURE 12

Enabling infrastructure for open source consumption and compliance

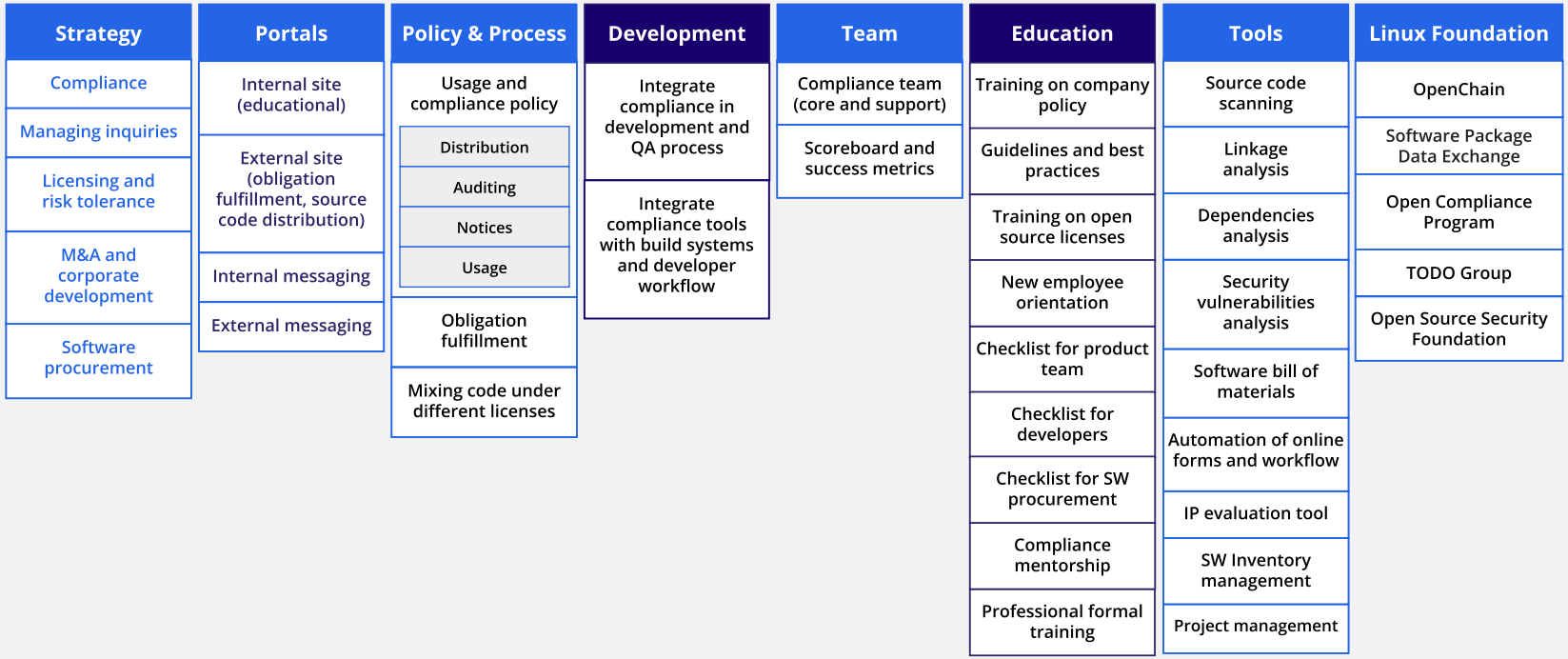
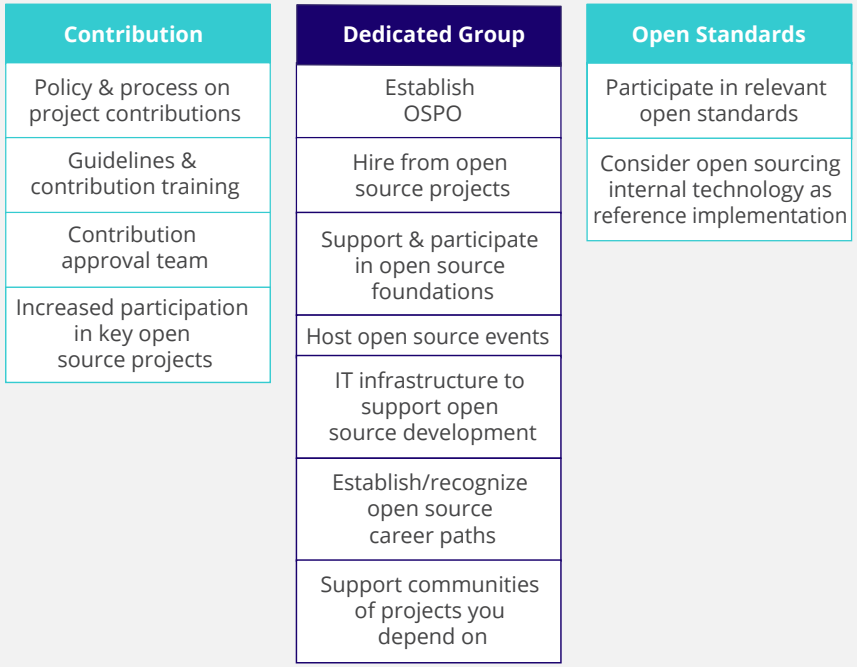


FIGURE 13

Necessary infrastructure for open source contributions



Prioritize and Drive Upstream Open Source Development

One of the primary responsibilities of an OSPO is to improve the organization's engagement with the key open source projects that are used in products and services. The first step is to identify where the organization relies on OSS by surveying all products and reviewing the SBOM. The next step is to prioritize the OSS that is already in use and establish a contribution strategy. Such a focused approach allows the OSPO to show a return on investment across multiple products. In an enterprise setting, where the OSPO and open source engineering are cost centers, the driving force should be to focus on open source projects that directly support product development.

FIGURE 13 illustrates the additional elements that the OSPO needs to implement to support open source contributions.

Engage with Open Source Organizations

Open source foundations are a great resource to extend your impact within the open source ecosystem. The best place to start is with foundations that host initiatives that are relevant to your products or technical interests. Many organizations find it worthwhile to get involved with well-known, established foundations, such as The Linux Foundation's TODO Group, the Mozilla Foundation, or the Apache Foundation. If your organization is primarily concerned with legal dynamics, getting involved with organizations such as the Software Freedom Law Center or the Open Invention Network will prove valuable. The primary goal is to identify the opportunities within the ecosystem that your organization relies on. The OSPO is the entity that drives these relationships based on the organization's open source strategy and product priorities.

Track Performance Metrics

One of the more difficult tasks for an OSPO is decision-making on key performance indicators or metrics that the office should track to incentivize engineers toward the desired behavior. The traditional metrics, which are often used in product organizations, do not apply in the context of open source development. Therefore, new metrics are required. Many OSPOs use specialized tools to track their organization's contributions to open source projects, analyze the type of contributions from their organization, identify contribution patterns, and provide recommendations to improve the development impact.

IMPLEMENT INNERSOURCE PRACTICES

Innersource describes the process of applying the lessons that were learned from open source development methodology to internal projects. The goal is to incubate the same values in the enterprise as those that are common in the collaborative, open source development model.

A great method for OSPOs to expand the impact of open source is to foster internal collaboration using innersource practices. These internal collaborations present incredible visibility opportunities for the OSPO with other departments or teams within the organization. In addition, such interactions and collaborations position the OSPO staff as the internal experts on open source practices and create new opportunities to collaborate with R&D and product teams.

GROW OPEN SOURCE TALENT INSIDE THE ORGANIZATION

One of the core responsibilities of an OSPO is to grow the open source talent inside the organization. To do so, OSPOs can run various programs, including workshops, training, mentoring, and internal evangelizing. Education is an essential building block in an OSPO, and it falls into the following two categories: technical training to expand open source technical knowledge and compliance training to ensure that the employees possess a good understanding of the policies that govern the use of OSS. The goal of this training is to raise awareness of open source policies and strategies to build a common understanding of the issues and facts of open source licensing and the business and legal risks of incorporating OSS in products or software portfolios. The training also serves as a venue to publicize and promote compliance policies and processes within the organization and foster a culture of compliance.

Moreover, OSPOs can create mentoring programs where senior open source developers mentor junior developers, review their code commits, provide feedback on code before it is submitted to the upstream projects, and generally act as an advisor. The goal is to accelerate learning and support junior developers to become more effective and influential in open source projects.

A great method for OSPOs to expand the impact of open source is to foster internal collaboration using innersource practices. These internal collaborations present incredible visibility opportunities for the OSPO with other departments or teams within the organization.

OFFER ADVICE ON OPEN SOURCE

OSPOs act as advisors on all matters related to OSS, whether they are internal issues to the organization or external issues relating to compliance, open source foundations, open standards, mergers and acquisitions, or other matters. Because of the importance of this advisory role, senior OSPO staff plays a critical role in shaping their organizations' software strategy, as OSS is critical within the larger software ecosystem.

MANAGE OPEN SOURCE IT INFRASTRUCTURE

One of the OSPO's challenges is to ensure that their organization provides an IT infrastructure that allows open source developers to communicate and work with the open source projects with minimal challenges. The following three primary domains of IT services are common in open source development:

1. Knowledge sharing: wikis, collaborative editing platforms, and public websites.
2. Communication and problem-solving: mailing lists, forums, and real-time chat.
3. Code development and distribution: code repositories and bug-tracking platforms.

Some or all of these tools will need to be available internally to effectively support open source development. These open source practices typically require an IT infrastructure that is less restrictive than a typical corporate environment. If this situation conflicts with existing organization-wide IT policies, it is vital to resolve these conflicts and allow open source developers to use the tools that are most familiar to them. It is worth noting that some OSPOs in large organizations create and manage their own IT infrastructure independently from their corporate IT departments.

Saying "no" is unequivocally the author's favorite OSPO responsibility. OSPOs act as a gating function for all major contributions that leave the organization, including new projects or contributing major proprietary code. Saying "no" is the responsibility of OSPO leaders when proposals to release open source projects or contribute significant bodies of code do not meet the proper requirements for success.

ELIMINATE FRICTION FROM USING AND CONTRIBUTING TO OPEN SOURCE

OSPOs help organizations navigate internal politics or policies, maintain relationships with communities of strategic importance, and continuously improve processes and tools to scale and reduce the learning curve and manual effort that is required.

SUPPORT CORPORATE DEVELOPMENT ACTIVITIES

OSPOs should be involved with open source due diligence (technical and compliance) as a part of corporate development. The two major scenarios are merger and acquisition transactions and outsourced development.

Mergers and Acquisitions

If an organization is considering a merger or is the target of an acquisition, the OSPO is a great source of expertise for open source technology and compliance due diligence. OSPOs can help their organization to understand the open source code that is used by the target organization and its implications as part of the due diligence process.

Outsourced Development

The OSPO can also support corporate development when negotiating the outsourced development of software, which will ensure that the proper compliance procedures are followed according to the organization's policies and processes.

COLLABORATE WITH UNIVERSITIES ON OPEN SOURCE PROJECTS

Many universities are eager to work with organizations that offer learning opportunities for their students and provide them with real-world development experience. Often, this relationship is also beneficial to the organizations that are involved because it can be a great way to develop new talent in existing open source communities and attract new development talent from a trusted source. This is particularly useful for projects that have a shortage of experienced developers and are typically more difficult to hire for. As the supply of talented programmers is limited, finding a way to tap into new knowledge and influence favorable outcomes in external projects, including academia, is vital.

KNOW WHEN TO SAY "NO"

Saying "no" is unequivocally the author's favorite OSPO responsibility. OSPOs act as a gating function for all major contributions that leave the organization, including new projects or contributing major proprietary code. Saying "no" is the responsibility of OSPO leaders when proposals to release open source projects or contribute significant bodies of code do not meet the proper requirements for success.

OSPOs and Eliminating Friction From Using or Contributing to OSS

OSPOs face many challenges that we can group into the following five areas: culture, processes, tools, continuity, and education. **FIGURE 14** illustrates these challenge areas. The general goal of an OSPO is to make it easy for the organization to use and contribute to OSS in support of its business goals. As such, facing and resolving these challenges and possibly others that are unique to your organization will help you achieve your goal.

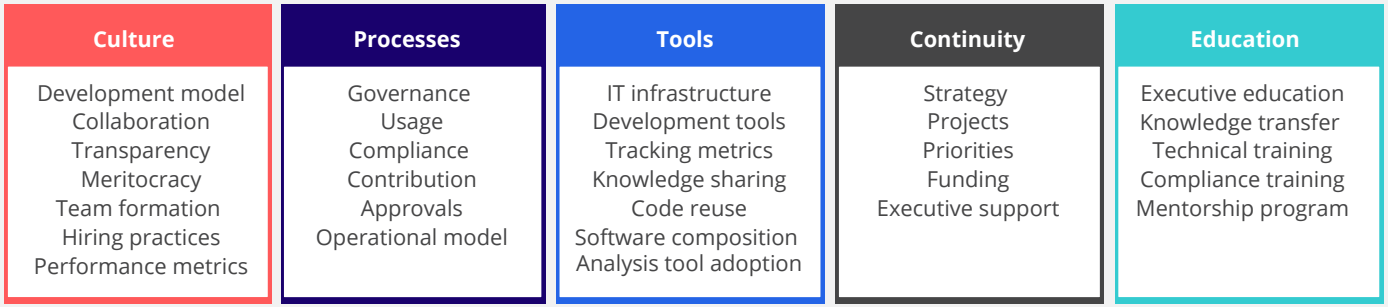
Culture

Cultural challenges often stem from the gap between traditional software development practices and the requirements of open source development. To bridge this gap, you can hire open source experts and ask them to train other groups that are unfamiliar with the open source development model. These experts can provide guidance to assist with the following:

- Create internal processes that follow the open source development practices of release, doing so early and often, and including peer reviews.
- Improve transparency between departments to encourage more cross-functional collaboration.
- Form engineering teams around the ideals of meritocracy.
- Establish proper success metrics to encourage open source and cross-department contributions.

FIGURE 14

Challenges that OSPOs face



Processes

Open source development is dynamic, moves very quickly, and has unique requirements for compliance. Software-driven industries will leave behind those organizations that do not adapt their internal processes to support this type of development. As developers must be able to contribute code upstream quickly, the enterprise must modify any internal code policies that hinder such development. We suggest implementing the following to improve internal processes:

- Put a team in charge of maintaining open source compliance to avoid legal problems and set up a simple internal approval model for open source use and contributions.
- Move from highly complex and cumbersome policies to a more straightforward approach for receiving, reviewing, and approving source code contributions.
- Balance the interests of legal, engineering, and open source and give the dedicated open source team blanket approval to contribute to many open source projects.
- Use different levels of approval depending on the nature of the code that is contributed (e.g., code to fix simple bugs, code to improve existing functionality, code to affect new functionality, or code to seed a new project).

The IT environment that you create should allow developers to join a team without requiring any significant changes to how they work. The tools must support the open source development model, fulfill the needs of the OSPO, and meet corporate IT guidelines.

TOOLS

The IT environment that you create should allow developers to join a team without requiring any significant changes to how they work. The tools must support the open source development model, fulfill the needs of the OSPO, and meet corporate IT guidelines. Open source engineers require flexibility to communicate with external participants via email, chat, and code development platforms, and their IT tools must facilitate this communication. For example, emails to an open source project should never include attachments that claim the content as the intellectual property of the email sender's organization. We suggest implementing the following changes for facilitating communication within your OSPO:

- Allow communication with public mailing lists from organization accounts without obstruction.
- Give engineers devices that support the development distribution of their choice.
- Make sure that all open source developers can access all vital internal tools and resources on Linux or via a separate compatible device.
- Support fully distributed teams that are working in remote locations so that they can connect to internal business resources through a virtual private network or similar technology.
- Evaluate your IT policies for help desk support, with secure methods for resolving IT issues for remote employees.

Continuity

For some organizations, continuity suggests a long, boring document that nobody reads. When it comes to OSS, continuity is an ongoing challenge as the organization adapts to changes in its business, business strategy, and industry. In practical terms, we can break continuity into the following three categories:

1. **Continuity of the open source strategy.** Informing current and future employees of the ever-evolving open source strategy, with updates on new developments and changes in real time.
2. **Continuity of projects and priorities.** Ensuring continued involvement in open source projects and initiatives to make use of any momentum that preceded a period of disruption or changes in the organizational environment.
3. **Continuity of executive support and funding.** Ensuring continued financial and executive support and providing adequate resources to support the open source program. The executive sponsor is critical to continuity and communicating the value of the open source efforts and expectations across the organization to encourage the successful adoption, implementation, and contribution to open source projects.

Education

Open source software is an integral part of the software landscape, with significant benefits for users and the ecosystem. However, to realize these benefits, organizations must overcome knowledge deficits through education and training as follows:

EXECUTIVE TRAINING

These courses help executives and managers to understand and articulate the basic concepts for building effective open source practices. Such courses often cover techniques for building effective processes and strategies for consuming OSS, creating new open source projects, contributing to projects, and driving software leadership in the open ecosystem.

COMPLIANCE TRAINING

With the adoption of OSS comes the responsibility to respect and fulfill the IP obligations of applicable open source licenses. To that end, organizations provide employee training on the basics of OSS, open source licenses, how copyright works, and the organization's policies and processes.

MENTORSHIP PROGRAMS

To increase open source knowledge and technical skills, organizations set up mentoring programs in which a senior open source developer guides a junior developer in a structured and often one-to-one relationship. The goal is to transfer knowledge and train mentees on how to work effectively with open source projects while increasing their technical competencies in their specific domain.

TECHNICAL TRAINING

Technical training expands the technical knowledge base of staff. It addresses weaknesses and upskills employees to do new and different tasks. The open source training industry is thriving because of the high demand for open source skills and training on the latest open source technologies.

The TODO Group

The TODO Group is an OSPO resource hub and open community of practitioners who aim to create and share knowledge and collaborate on practices, tools, and other ways to run successful and effective OSPOs or similar open source initiatives. It was formed by its 1,700+ community participants and 80+ general members across different sectors and regions and managed as an open source project under The Linux Foundation. The TODO Group offers a maturity model, set of guides, mind map, 101 course, annual surveys, and case studies to help organizations advance in their OSPO journey. These OSPO resources are developed by the TODO Group in collaboration with The Linux Foundation and the larger open source community. If you are looking to establish an OSPO in your organization, or you lead an OSPO and are looking to connect with peers at other organizations, please visit todogroup.org/community to get started and join our Slack channel or OSPO forum discussions.

Conclusion

OSPOs play a critical role in helping organizations master OSS and driving organizations into leadership positions in open technologies that are critical to their products, services, and IT solutions. OSPOs can support their organizations in the following four key areas:

1. **Consumption —** Establish an internal infrastructure that enables proper open source practices and incorporates open source policies, processes, checklists, and training.
2. **Participation —** Engage with the open source community on communication platforms and at events. Sponsor projects and organizations that are important to the OSS that your organization relies on for its products and services.
3. **Contribution —** Hire or train developers that focus specifically on open source contributions and deploy the necessary tools to support internal open source engineering.
4. **Leadership —** Increase engagement with open source communities, open standards bodies, and open source foundations; launch new open source initiatives and projects; and increase your organization's visibility in open source communities.

If you are part of an organization that relies on OSS for products or services and your organization does not have a formalized OSPO yet, please consider this report a call to action to do exactly that.

Acknowledgments

The author would like to express his sincere appreciation to his Linux Foundation and TODO Group colleagues, Chris Aniszczyk, Hilary Carter, Ana Jimenez, Jason Perlow, Melissa Schmidt, and Barry Hall, for their valuable reviews and feedback. This report has benefited immensely from their experiences and contributions.

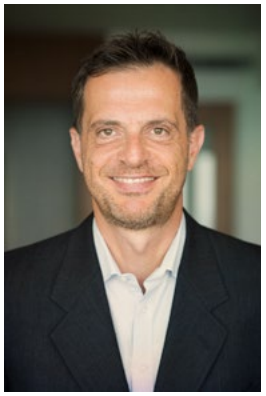
Linux Foundation Resources

- E-book: Guide to Enterprise Open Source
- E-book: Open Source Compliance in the Enterprise
- E-book: Open Source Audits in Merger and Acquisition Transactions
- Linux Foundation Enterprise Guides
- Linux Foundation Open Compliance Program — Resources to support organizations with open source compliance.
- TODO Group — Open community of practitioners and organizations that collaborate on best practices, tools, and other ways to run successful open source programs.

Feedback

The author apologizes in advance for any spelling mistakes or possible errors and is grateful to receive corrections and suggestions for improvements via ibrahimatlinux.com/contact.html.

About the Author



Dr. Ibrahim Haddad is Vice President of Strategic Programs at The Linux Foundation and the General Manager of LF AI & Data, which provides a trusted hub for developers to code, manage, and scale critical open source artificial intelligence and data projects. Before The Linux Foundation, he served as Vice President of R&D and Head of the Open Source Division at Samsung Electronics. Throughout his career, Haddad held technology and portfolio management roles at Ericsson Research, the Open Source Development Labs, Motorola, Palm, Hewlett-Packard, and The Linux Foundation. He graduated with honors from Concordia University (Montréal, Canada) with a Ph.D. in Computer Science.

Twitter: @IbrahimAtLinux

Website: IbrahimAtLinux.com

Disclaimer

This report is provided "as is." The Linux Foundation and its authors, contributors, and sponsors expressly disclaim any warranties (express, implied, or otherwise), including implied warranties of merchantability, noninfringement, fitness for a particular purpose, or title, related to this report. In no event will The Linux Foundation and its authors, contributors, and sponsors be liable to any other party for lost profits or any form of indirect, special, incidental, or consequential damages of any character from any causes of action of any kind with respect to this report, whether based on breach of contract, tort (including negligence), or otherwise, and whether they have been advised of the possibility of such damage. Sponsorship of the creation of this report does not constitute an endorsement of its findings by any of its sponsors.

THE LINUX FOUNDATION | Research

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 repository for open source insights for the benefit of organizations the world over.

twitter.com/linuxfoundation
facebook.com/TheLinuxFoundation
linkedin.com/company/the-linux-foundation
youtube.com/user/TheLinuxFoundation

LF AI & DATA

Part of The Linux Foundation, LF AI & Data supports open source innovation in artificial intelligence, machine learning, deep learning, and data. LF AI & Data was established to support a sustainable open source AI ecosystem that makes it easy to create AI and data products and services using open source technologies. We foster collaboration under a neutral environment with an open governance model to support the harmonization and acceleration of open source technical projects.

TODO

TODO is an open group of 70+ organizations with years of experience running open source programs that want to collaborate on practices, tools, and other ways to run successful and effective open source projects and programs. It is a place to share experiences, develop best practices and guidance as well as work on common tooling to improve OSPO adoption and education worldwide across sectors. Discover more about all the ongoing TODO Initiatives here and check out the OSPO landscape: https://landscape.todogroup.org

twitter.com/todogroup facebook.com/todo linkedin.com/company/todo-group

To reference the work, please cite as follows: Ibrahim Haddad, "**A Deep Dive Into Open Source Program Offices: Structure, Roles, Responsibilities, and Challenges** " foreword by Chris Aniszczyk, August, 2022.