



Enabling Digital Transformation in Europe Through Global Open Source Collaboration

White Paper



Open Source Collaboration Drives Faster, Lower Cost Innovation to Increase Competitiveness



Open source software delivers important strategic advantages to every organization that is undergoing, driving, or developing digital transformation initiatives – from corporations and governments to research and academic institutions. It is at the heart of ensuring the move to software-based processes, operational models, decision-making, and end-user experiences happens in a sustainable way. And it opens doors to new opportunities that are not available, or possible, through any other means.

Everyone who participates in the open source software ecosystem can easily collaborate, learn from, and share their experiences and expertise with one another. This collaborative, transparent, and vendor-neutral approach to software development allows every ecosystem member to increase their own visibility in Europe, and globally, and to develop important new relationships, no matter what their size or focus area.



The ability to easily incorporate readily available, commercial-grade software building blocks gives ecosystem members a strong foundation for further innovation and customization. They can leverage this foundation to accelerate their own digital transformation initiatives. They also have the flexibility to enhance and tailor the open source software to address key industry and technology trends, resolve critical business and market challenges, and target pain points in their own organization.



By and large, the open source software ecosystem is committed to the ideals of well-governed, vendor-neutral collaboration and understands the value of high-quality open source code. Code is written by leading developers and technology experts who

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understand their work will be used by others and are highly motivated to deliver the best possible results. Their expertise and dedication to the principles of open source software speeds delivery of much-needed strategic technology initiatives.

Ecosystem members have access to critical development skillsets and knowledge that would be challenging or cost-prohibitive to access otherwise. According to digital economist, Dr. Holger Schmidt, digital transformation is accelerating and many digital transformation projects fail, or stall, due to lack of specialized resources.¹

¹ The following link opens the original article in German. To translate the content, please configure your browser accordingly.
<https://www.netzoekonom.de/2018/07/02/der-flaschenhals-der-digitalen-transformation-sind-die-fachkraefte/>

The cost savings and operational benefits that result when ecosystem members pool resources are significant. Each member can reduce their own headcount expenses, lower development costs, and mitigate business risks by creating de facto standards that open and accelerate commercial markets. They can also leverage open source architectures and tools to increase interoperability among their digital transformation solutions while optimizing development efficiency and costs.



From a competitive perspective, open source ecosystems give their members new opportunities to disrupt the way intellectual property is managed. These opportunities strengthen the competitive edge and stature of European organizations, countries, and the overall European Union globally.

With the many advantages of open source software, it's clear why Europe already has a large and

successful open source ecosystem and why the European Commission considers open source initiatives to be strategically important to shaping Europe's digital future.² As imperatives such as citizen privacy, digital competitiveness, and independence from proprietary, locked-in solutions become increasingly important across Europe and around the world, European organizations can't afford to delay their move to open source.

“Some companies think they should keep their ideas secret. But in the digital economy, sharing ideas and collaborating with others can actually help build a competitive advantage,” says Gaël Blondelle, vice president of European ecosystem development at the Eclipse Foundation. **“And open source collaboration with a diverse community, under a strong governance model, is a sure way to achieve cost-effective, fast, and scalable innovation.”**

² <https://ec.europa.eu/digital-single-market/en/news/workshop-about-future-open-source-software-and-open-source-hardware>

Open Source Software Strengthens Europe's Role in the Global Platform Economy

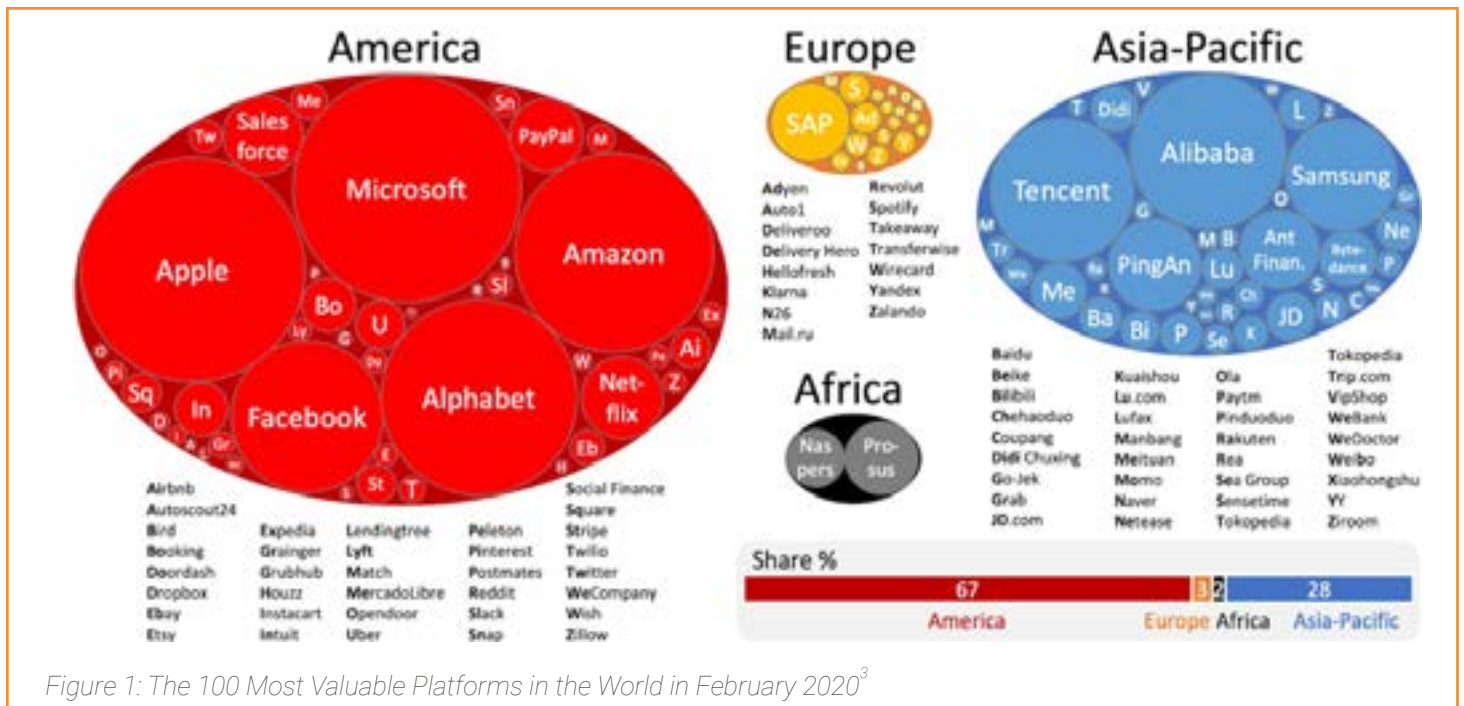


To play a prominent role in the global platform economy, European organizations must join forces with each other, and with other global organizations, to collaborate on open source software. With this approach, they are in a far better position to:

- Take advantage of entrepreneurial opportunities
- Address global challenges and markets
- Level the global playing field by increasing their ability to compete on an international scale

In February 2020, the top 100 platform companies in the world were valued at a total of 8.9 trillion dollars, according to digital economist, Dr. Holger Schmidt. European companies were responsible for a far smaller share of this total value than North American and Asia-Pacific companies in the overall landscape.

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A Robust Framework Supports and Protects All Ecosystem Members

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Platforms such as GitHub provide convenient tools to share code and collaborate, but collaborating on code is just one part of driving successful, open innovation with open source software. It is equally important, if not more so, to collaborate under an established governance and legal framework that ensures a level playing field for all collaborators. As soon as one ecosystem member wants to commercialize products built with open source technologies, it is imperative to manage intellectual property and ensure compliance with legal requirements.

The ideal collaborative open source software environment enables sustainable digital transformation by providing key benefits to all stakeholders:

- Researchers, academics, and government organizations can freely leverage and collaborate on open source software that is critical to furthering their area of study or delivering on their public mandate.
- Innovators can build an open, entrepreneurial ecosystem that enables global industry players and technology adopters to collaborate and build on their innovations to benefit corporations and the public.
- Small companies gain access to a world that allows them to dramatically broaden their global visibility, access expertise, and take advantage of market opportunities.

- Large companies can openly collaborate to reduce the costs of developing platforms they need for business and differentiate by building products on top of those platforms.

The Eclipse Foundation provides the open source software communities, governance and legal framework, and support services all of these stakeholders need to fully realize the benefits of open source collaboration.

The Foundation is the largest open source organization in Europe, but also brings an international reach and a very established reputation in open source software. This combination puts the Eclipse Foundation in a unique position to help European organizations drive sustainable digital transformation and advance Europe's position in the global platform economy.

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Eclipse Foundation Open Source Communities Give European Organizations Crucial Advantages



The Eclipse Foundation is the focal point of industrial open source collaboration in Europe. The Foundation provides access to vibrant, open source software communities for more members, developers, and projects than any other European organization.

The Foundation's European base includes 170 member organizations and more than 900 committers. In addition, the Foundation has operated the Eclipse Foundation Europe GmbH for more than seven years, and has been a long-time, respected supporter of, and contributor to, European research processes.

Participating in Eclipse Foundation communities is the fastest and easiest way for European organizations to establish international collaboration at industry scale. In addition, the Foundation's Working Groups provide a very efficient mechanism to create domain-specific focus areas within the framework of the Eclipse Foundation.

The Eclipse Foundation's established, vendor-neutral governance and legal framework enables all community members to share their knowledge and expertise without the significant complexity and costs of setting up multiple consortium agreements. Community members can also ensure they comply with antitrust laws, and have the legal assurance they can rightfully embed open source technologies in their commercial products.

As the platform for entrepreneurial open source, the Eclipse Foundation is committed to fostering open source software projects that are community-driven, code-first, and commercial-grade. All aspects

of Foundation operations are business-friendly and focused on projects that are proven to deliver high-quality, scalable, and sustainable open technologies that companies can use to build commercial products, grow revenues, and drive market adoption.

To help ensure the success of the projects it hosts, the Eclipse Foundation provides a number of services to help strengthen and grow open source software ecosystems. These enabling services include:

- Proven processes and best practices for open source software development.
- Intellectual property (IP) management services that ensure IP is tracked and properly managed.
- Licensing of code under the Eclipse Public License, a commercial-friendly open source license approved by the Open Source Initiative. The Foundation also accepts projects under other business-friendly licenses, such as Apache 2.0, BSD, and MIT.
- Mentorship, guidance, and expertise in creating and managing open source projects and in community building and support.
- Marketing support to increase project visibility within the broader Eclipse ecosystem and beyond.

Together, these services provide a strong foundation for open source collaboration (Figure 2). Community members can then customize and enhance the open source software with their own innovations to bring competitive, value-added products and services to market.

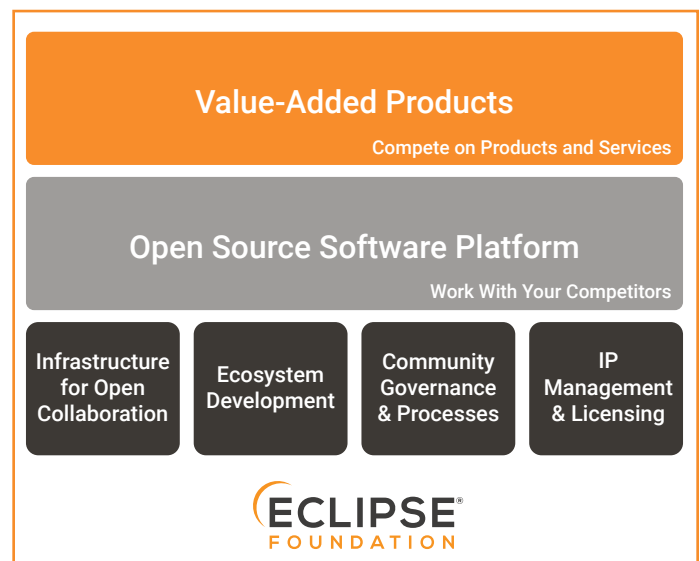
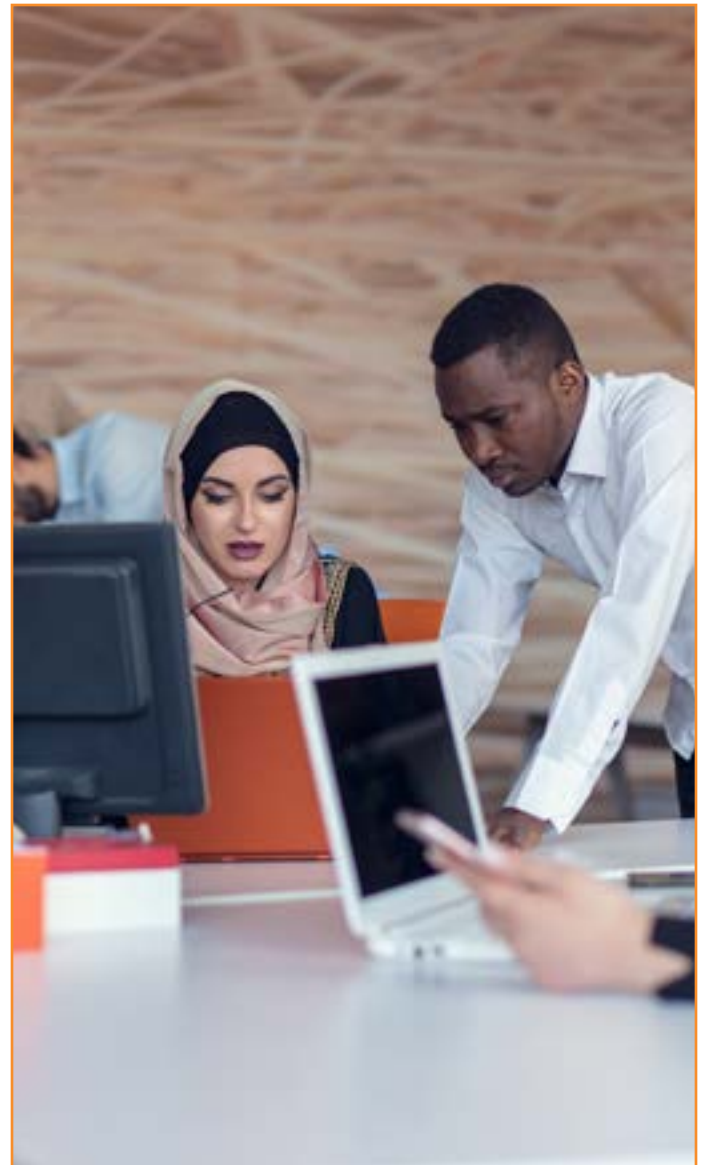


Figure 2: The Eclipse Foundation Stimulates Open Source Collaboration and Innovation

The Eclipse Foundation Is at the Center of European Open Source Innovation



To ensure the open source software developed at the Eclipse Foundation aligns with real-world requirements and priorities, projects are focused around four strategic areas:

- **Cloud native technologies for Java.** The Eclipse Foundation provides a collaborative environment for the world's leading Java ecosystem players to advance open source enterprise Java technologies for the cloud. Eclipse communities provide a mix of technologies that support new, cutting-edge applications while also giving enterprises a migration path for existing Java applications.
- **IoT and edge.** The Eclipse Foundation enables industry leaders to collaborate on an end-to-end IoT architecture that is secure, flexible, and fully based on open source and open standards.
- **Automotive.** The Eclipse Foundation provides leading automotive original equipment manufacturers (OEMs), their suppliers, and partners with a sustainable, transparent, and vendor-neutral platform to collaborate on open technologies and standards.
- **Developer tools.** The Eclipse Integrated Development Environment (IDE) is the critical development environment for more than six million active users. Now, the Eclipse community is building on our roots in open source developer tools to create the next generation of cloud native developer tools.

European organizations in a variety of industries, with different operational and commercial goals, are benefiting from their membership in the Eclipse Foundation.

Bosch Finds Strategic Advantages in the Eclipse IoT Community



BOSCH

When Bosch.IO, a subsidiary of the Bosch Group, decided

to pursue an open source strategy for its IoT platform, the company increased its membership level in the Eclipse Foundation to become a Strategic Member and joined the [Eclipse IoT Working Group](#).

Today, Bosch has more than 60 developers working on Eclipse IoT projects, and has contributed approximately 1.5 million lines of code to Eclipse IoT projects. Many of the Bosch IoT Suite commercial cloud services are based on Eclipse IoT projects.

The open source collaboration opportunities at the Eclipse Foundation have had multiple benefits for Bosch.IO. The company's developers enjoy working closely within the community, and the open source development model has helped to recruit new developers who want to work on open source.

Caroline Buck is the head of portfolio management at Bosch.IO, and a member of the Eclipse IoT Steering Committee. "Open source development has enabled us to transform how we build software internally and it is making our organization a better product company. Any company that is serious about IoT should consider an "open source first" strategy. If you are planning to do open source IoT, then Eclipse IoT is THE community we recommend," she says.



Obeo Shares Its Expertise to Develop Key Relationships and Take Its Business Global

Open source is central to the philosophy of French systems engineering company, Obeo, another Strategic Member of the Eclipse Foundation. Obeo creates modeling technologies that optimize industrial systems



design and enhance the growth and development of large companies.

Obeo is a smaller and younger company than some of the other Strategic Members at the Eclipse Foundation, but has been able to use its premium membership role to build relationships with larger, global organizations, such as Thales, Ericsson, and Siemens, and grow its business.

“From our position as global leader in Eclipse Modeling technologies, we have built a client portfolio of some 200 major names both within France and internationally,” says Obeo CEO, Cédric Brun. “More than a quarter of our business now stems from exports.”



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The German Aerospace Center Strengthens and Disseminates Its Globally Recognized Simulation Software



The [Eclipse Simulation of Urban Mobility \(SUMO\)](#) project is giving developers at the

German Aerospace Center new opportunities to reach a broader audience of researchers and industries that can add cutting-edge research and algorithms to improve its open source traffic simulation software.

The team’s open source software is used around the world to help organizations and municipalities better understand vehicle traffic patterns, parking implications, the effects of traffic streamlining initiatives on traffic flows, and other traffic-related issues.

According to project co-lead, Robert Hilbrich, developing the software in an open, vendor-neutral way at the Eclipse Foundation has been very important in an industry that wants to avoid vendor lock-in. “Having a software platform that’s not linked to a particular vendor, is of very high quality, and very rich

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in functionality has been the cornerstone of success for the SUMO project,” he says.

In 2019, industry interest in the Eclipse SUMO project reached the point where it made sense to create the [openMobility Working Group](#) at the Eclipse Foundation. The Working Group provides a roundtable that brings together key customers and users with a vested interest in the future of SUMO in a consortium that can steer and influence its direction.

Eclipse Projects Bring Important Technologies to European Organizations

The Eclipse Foundation is home to industry standards and an open source stack for building and running enterprise applications and workloads from the cloud to the edge. The following examples highlight innovative Eclipse community efforts across cloud, edge, and artificial intelligence (AI) technologies.

- [Eclipse Kuksa](#) unifies vehicle, IoT, cloud, and security technologies across the complete tooling stack for the connected vehicle domain to enable a standardized approach to Vehicle-To-Cloud (V2C) scenarios across all vehicles. Kuksa was initiated through the ITEA 3-funded Application Platform for Cars and Transportation Vehicles ([APPSTACLE](#)) research project and the technology has been used in real-world demonstrations by European companies, such as Bosch and Otokar.
- [Eclipse Che](#) is a Kubernetes-native IDE that makes it much faster and easier to develop enterprise applications that leverage containers

and Kubernetes. Leading technology providers, including Broadcom, IBM, SAP, Red Hat, and Samsung rely on Che to provide a modern developer experience for, and in, the cloud.

- [Eclipse Theia](#) is a true open source alternative to Microsoft Visual Studio (VS) Code that gives organizations and developers a single, modern technology stack to build customized IDEs for desktops and browsers. Theia has been adopted by globally recognized technology companies, such as ARM, Google, Red Hat, Arduino, SAP, and Gitpod.
- [Eclipse Deeplearning4j](#) takes deep learning and AI applications out of the theoretical, academic world and into the real world where they can be applied in useful and meaningful ways across industries. The Eclipse Deeplearning4j technology is the first commercial-grade, open-source, distributed deep learning library written for Java and Scala.
- [Eclipse fog05](#) is a fog computing platform that provides a decentralized infrastructure for distributing compute, storage, control, and networking functions closer to users along a cloud-to-edge continuum.
- [Jakarta EE](#) brings developers the modern enterprise Java technologies needed to develop, deploy, and manage server-side and cloud native applications. This overarching project encompasses all Eclipse projects related to Jakarta EE, the open source successor of Java EE.

- [Eclipse Capella](#) provides an open source solution for model-based systems engineering (MBSE). This comprehensive, extensible, and field-proven MBSE tool and method is ideal for formalizing system architecture requirements and designs.
- [Eclipse IoT Packages](#) develops fully integrated packages that demonstrate how two or more Eclipse IoT projects can be used together to deliver particular functionality or address a particular challenge. Each package uses Kubernetes as the base and includes the documentation and Helm charts needed for deployment.



Achieve Your Goals at the Eclipse Foundation

To provide the optimal level of community involvement for each organization and for individual developers, Eclipse Foundation offers [four types of memberships](#).

- **Strategic Members** typically lead one or more top-level projects. They have a seat on the Eclipse Foundation Board of Directors, as well as on Foundation councils, including the Planning and Architecture councils.
- **Contributing Members** typically view Eclipse technologies as important to their corporate and product strategies, and offer products and services that incorporate Eclipse technologies.
- **Associate Members** typically participate in, and show support for, the Eclipse ecosystem. This is often the appropriate level of membership for research and educational institutions.
- **Committer Members** are individuals who are core developers of Eclipse Foundation projects and can commit changes to project source code.

For more information about Eclipse Foundation memberships and the value they offer, [review our membership presentation](#).

To become an Eclipse Foundation member, please contact us.

About the Eclipse Foundation

The Eclipse Foundation provides its global community of individuals and organizations a mature, scalable, and business-friendly environment for open source software collaboration and innovation.

The Foundation is home to the Eclipse IDE, Jakarta EE, and more than 400 open source projects, including runtimes, tools, and frameworks for cloud and edge applications, IoT, AI, automotive, systems engineering, distributed ledger technologies, open processor designs, and many others.

The Eclipse Foundation is a not-for-profit organization supported by more than 300 members, including industry leaders who value open source as a key enabler for their business strategies.

To learn more, follow us on [Twitter](#) and [LinkedIn](#), or visit eclipse.org/europe.