

Why open source software matters to your enterprise

The business pros and cons of open source software

The TODO Group (European Chapter) | September 2020



Executive summary

Open source software has proven to be so vital to business success that it is commonly used and published by companies focused primarily on shipping proprietary products. Today, IBM [owns open source software](#) giant Red Hat, at a purchase price of \$34 billion, and Microsoft [bought GitHub](#), the largest host of source code in the world, for \$7.5 billion. These hefty investments and forklift-sized technology changes are based on solid business cases rather than mere whims or trends. It's an indication of significant changes in business strategies and business models. Two examples are highlighted in the sidebars.

There are many business reasons to use open source software. Many of today's most significant business breakthroughs, including big data, machine learning, cloud computing, Internet of Things, and streaming analytics, sprang from open source software innovations.

Open source software often comes into an organization as the backbone of many essential devices, programs, platforms, and tools such as robotics, sensors, the Internet of Things (IoT), automotive telematics, and autonomous driving, edge computing, and big data computing. Open source software code is working on many smartphones, laptops, servers, databases, and cloud infrastructures and services. Developers build most applications by leveraging frameworks like Node.js or pulling in libraries that have been tested and proven in many production use cases. To use almost any of these things is to use open source software in one form or another, and often in combination.

It also hastens innovation. Often, internal developers contribute and maintain code in open source software projects on behalf of their employers and sometimes

as a hobby project. In terms of career development and earned social reputation, developers' attraction to work on open source projects is so compelling that you may be losing developers to competitors who more aggressively leverage open source software. Further, companies that allow and encourage developers to participate in the open source software community during business hours tend to recruit and retain the brightest talent, even in a tight labor market. In a testament to the popularity of open source software among developers, there were over 40 million developers on GitHub in 2019, 10 million were new users, [according to GitHub's annual Octoverse Report](#).

By using open source software, companies also avoid building everything from the ground up, saving time, money, and effort while also rendering more innovation from the investment. Open source software is generally more secure than using the commercial proprietary counterparts too. That is due in large part to the

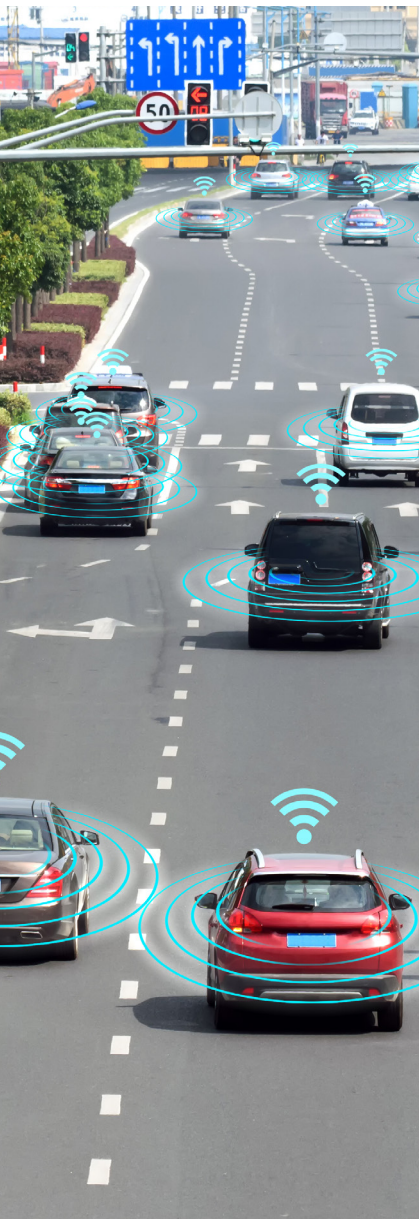
collaborative nature of open source software projects. A common phrase used by Open Source developers and advocates is that "given enough eyeballs, all bugs are shallow." That holds so long as there are "enough eyeballs," which, given open source software's adoption rate, may be challenging to have across all projects.

Drawbacks do exist, as no software is perfect, not even open source software. However, for most organizations, the good far outweighs the bad. The codebase's open nature also means it's easier to report and fix software versus alternative models.

While open source software offers many reliable and provable business advantages, sometimes those advantages remain obscure to those who have not looked deeply into the topic, including many high-level decision-makers. This paper aims to provide a balanced and quick overview of the business pros and cons of using open source software.

[Barcelona] underscores its commitment to speeding smart city innovations by its **"use and promotion of Free Software and open technologies as a social good**, to enable collaboration between administrations and to escape vendor lock-ins..."

- Free Software Foundation Europe (FSFE) [Report](#)



What is open source software?

Open source software means computer source code that is made publicly accessible and can be modified, and shared. "Open source software" began as a descriptive term of this specific approach to software licensing and development. Under the [Open Source Definition](#) created by Open Source Initiative (OSI), the term no longer implies simply access to code, but also adherence to distribution, licensing criteria, and community spirit and collaboration.

Initially, open source software was created by developers as an alternative to closed software development and distribution models they found to be lacking in one aspect or another. Today, open source software has matured to include an array of business models with a solid and highly competitive market presence. As is typical of a thriving and evolving industry, open source software programs, platforms, and open source software-based companies are being acquired as industry players begin to converge.

Today, open source software is mainstream across all business verticals. The open source software collaborative model has matured beyond individual developer collaborations to large and competitive

companies collaborating to resolve common issues and develop shared solutions. Today's challenges are often too large for any company or even several companies working together to solve. The best practice is building large and open source software ecosystems to collectively address multiple parts of the puzzle. This open but highly organized sharing of resources and knowledge eliminates many common industry obstacles and clears the way for competitive, innovative development.

In recent years, the trend of competitor collaborations within a single industry has led to the development of industry-specific open source software projects and foundations to produce commodity software. Two examples are the Academy Software Foundation and the Linux Foundation Energy.

The "fail faster" business concept also works faster and more efficiently in open source software. When collaboration is successful, it is moved into a foundation or standard. But if it is not successful, it can be dissolved as fast as it was formed.

Flexera estimates that "between 50 and 70 percent of the automotive software stack originates from open source today..."

- [Automotive World](#)

Opportunities and benefits of open source software

Open source software offers several distinct business advantages. Among them are cost reduction, speed to market, collaborative market advantages, differentiating functionality, increased security through “many eyes” community scrutiny and code improvements, increased efficiencies, and innovation jumpstarts.

Companies that use open source software and contribute to open source software projects also see a marked improvement in developer recruitment and retention. These organizations also benefit from significant external contributions to in-house open source software projects, which reduces cost and risk and speeds development.

This is accomplished via contributors and maintainers who are developers in open source software communities who add and improve source code so that all benefit from the work of many. Others in open source software communities work on related activities such as documentation and marketing.

By contrast, corporate internal developer groups cannot keep pace with a virtual army of dedicated and motivated developers and community members working together. This is especially when internal developers are handicapped with proprietary code, company silos, and multi-layered decisioning bureaucracies that are costly and restrictive. For example, it is difficult to modify, customize, share, integrate, and collaborate with outside parties. Such restrictions often limit innovation and invention, hobble additional security efforts, create

vendor lock-in, increase licensing costs, and create obstacles to getting new products and services to market.

Open source software communities also play significant roles in driving standardization, commoditization, and adoption rates – all of which add to the long list of business advantages by increased code and project stabilization, increased ease of integration, and project maturity. In turn, opportunities for new, open source software-based business models are created.

...New business prospects are booming for companies like **HERE**, for “connected vehicles, IoT devices, and other touchpoints **where mobility is core** (e.g., tracking, monitoring, and autonomous driving).”

- Analyst firm Omdia



Risks and mitigations

Open source software does not mean code that is free for anyone to grab and run without any responsibilities. There are responsibilities involved with the use of open source software code or projects. Licensing compliance is chief among them. Licenses have terms, and users and distributors of open source software need to respect and follow the license terms.

Actively contributing, maintaining, and sharing code and related work such as documentation is expected. Failing to do so can result in backlash and friction in the community. Project funding to support resources the community needs is also appreciated and sometimes expected from heavy users of the project.

Intellectual Property (IP) issues sometimes arise, since code modification and contributions are core activities in open source software communities. Companies need to be well-versed on the rules and conditions associated with each open source software project to discern the difference between contributing to the community and using open source software to build their IP. If companies work to understand this from the outset and plan accordingly, IP issues can be avoided.

Security is generally much more robust in open source software as many developers work to improve and maintain the source code. However, open source software codebases change all the time, including to fix security bugs. Open source software components

must be updated regularly. Updates require diligence and effort that extends to repairing potential and subsequent software and services breaks. Further, given open source software's popularity and its rise in adoption rates, it is becoming a much larger and more attractive target for attackers. Therefore, it is prudent to both help in securing open source software code and add layers of security atop any internal open source software project to thwart attackers better.

Make contributing back to the open source software project and community a dedicated part of your overall open source software plan. Allow internal developers to work on external open source software projects during business hours. Contribute time, effort, mentorships, and even funding to make open source software projects bigger, healthier, and more viable. This effort makes excellent business sense as your business, and product innovations will rely on the projects you selected to use. Therefore, it is in your interest to ensure those projects thrive and excel.

Open source software projects often compete with one another, and it is the better performing, better marketed, and better-funded projects that tend to win out. You don't want to see an open source software project that your company products are built upon disappear for lack of support, so make sure to lend those projects your support.

Where to get free expert help:

To learn more or to get free expert help on starting an open source software project, begin with one or more of these groups:



OPENCHAIN

OpenChain (<https://www.openchainproject.org/>) Open Source compliance chain management.



Open Source Software Tooling Group (<https://oss-compliance-tooling.org/>) Part of the OpenChain project, this workgroup is focused on reducing resource costs and improving the quality of results around open source compliance activities.



TODO Group (<https://todogroup.org/>) is an open group of companies who want to collaborate on practices, tools, and other ways to run successful and effective open source projects and programs.

Case study: Open source software in the European automotive industry

While open source software has not yet taken over the whole car from front to rear, it does have a strong footing in several subsystems from which it is spreading throughout the vehicle. Its growing presence within vehicles and the factories where vehicles are made is remarkable given the highly conservative and protective nature of the European automotive industry.

Like many other industries, the automotive manufacturing industry has shifted gears to become software companies as the entire world moves to digitalization. Notable among the many automotive industry changes is the connected car, wherein electrification and self-driving functions morph the car into a computer on wheels. Software has become both the main driver of the industry and the main differentiator between competitors.

Becoming a de facto software company via the urgency spurred by these market developments means there is little time to come up to speed. Open source software quickly became the acceleration ramp since a considerable

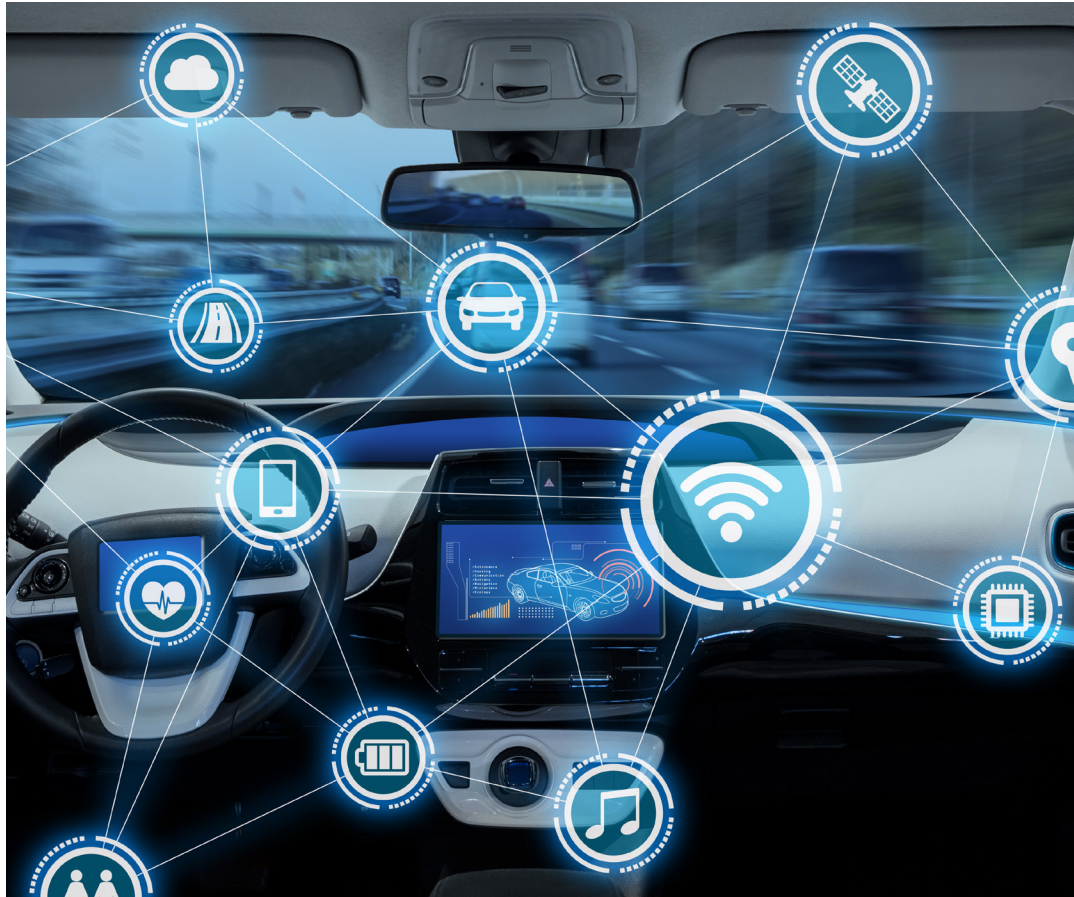
amount of the needed computer code already exists and is easily reused.

Further, open source software teams' collaborative nature, sometimes comprised of rivals and competitors, enables quicker common problem solving and faster time to market. In many industries, including automotive, the past decades saw OEMs focused on building specifications and a supply chain ready to implement those specifications into components. That model is rapidly changing, as it has in other industries such as telecommunications with the evolution to 5G.

One example is [Automotive Grade Linux](#), a collaboration of automakers, suppliers, and technology companies to accelerate the development and adoption of a fully open software stack for the connected car. A production-ready AGL automotive platform is freely available for anyone to download, modify, redistribute, and build solutions for commercial sale — it speeds up product and feature development immensely. Another example is [Eclipse Kuxsa](#), a collaborative open source software project designed to create an open source software ecosystem across the vehicle, IoT, cloud, and security domains.

Thus, open source software substantially lowers entry barriers and provides the legal and organizational framework necessary to make collaboration among highly competitive industry players both possible and profitable. The resulting solutions are also free of expensive encumbrances such as single vendor dependencies, often referred to as “vendor lock-in.” Flexera estimates

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that “between 50 and 70 percent of the automotive software stack originates from open source today,” [as stated in a recent article in Automotive World](#).

One example is Volvo's electric car company [Polestar](#). It recently announced a new fully electric Polestar 2 with an Android entertainment system. The company, like most of the industry, chose open source software Android to reduce development time and costs and to meet customer expectations in several areas, including large and stable app ecosystems and over-the-air (OTA) software updating. The company found using existing open source software technology gave it a jumpstart on its vision for a competitive product.

Another example is [HERE](#) Technologies, a location data and technology platform. While the company's roots are in-car navigation systems, it has expanded its automotive portfolio to include connected and automated driving services. HERE is also addressing customers in other industries with location-based offerings, such as transport & logistics, telecommunications, and retail.

According to a recent report by analyst firm Omdia, new business prospects are booming for companies like HERE, for “connected vehicles, IoT devices, and other touchpoints where mobility is core (e.g., tracking, monitoring, and autonomous driving).” This also has implications for smart cities (e.g., planning, transport flows, smart meters, and grids).

To take advantage of this new growth potential, HERE is leveraging open source software in its product development and is actively contributing back to the community to deliver better value to its customers and boost the developer friendliness of its platform.

Case study: European smart city initiatives driven by open source software

Europe is currently a world leader in smart city developments. For example, Stockholm earned the Smart City 2019 award for its [GrowSmarter project](#) at the [Smart City Expo World Congress](#) in Barcelona, according to a Cities Today report.

But Stockholm is only one example as several European cities are recognized globally as smart city development leaders. Barcelona is one such city. The second most populated city in Spain underscores its commitment to speeding smart city innovations by its “use and promotion of Free Software and open technologies as a social good, to enable collaboration between administrations and to escape vendor lock-ins,” according to a Free Software Foundation Europe (FSFE) [report](#). That same report pegs Barcelona’s investment commitment of “70% of the new development budget into free software development.”

Barcelona is establishing and sharing best practices it has developed along the way. It and other European cities are also collaborating to extend the smart city network beyond individual cities and countries’ boundaries.

“We are collaborating with Amsterdam, Torino, NYC, and others. There is a lot of collaboration going on; without Free Software this would not be possible,” said Francesca Bria, Chief Technology and Digital Innovation Officer at the Barcelona City Council, in the FSFE report.

Open source software is also relevant to cities beyond smart city initiatives. The city of Paris developed an open source software platform called Lutèce for providing government services, which has now also been leveraged in other regions, including Baltimore in the United States.¹

1. <https://technical.ly/baltimore/2019/04/19/paris-lutece-open-source-platform-city-services-west-baltimore-community-center-st-francis/>

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- Cities Today Report

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The Linux Foundation promotes, protects and standardizes Linux by providing unified resources and services needed for open source to successfully compete with closed platforms.

To learn more about The Linux Foundation or our other initiatives please visit us at www.linuxfoundation.org