

CASE STUDIES ON COMMUNITY-BASED OPEN SOURCE INITIATIVES

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1. Case study: Hyperledger -- The Linux Foundation Helps Hyperledger Build the Fastest Growing Open Source Ecosystem for Business Blockchain Technology

(Eclipse Foundation (2018). Case Study: How Bosch Is Succeeding with Open Source at Eclipse IoT. Retrieved February 15, 2020 from <https://eclipse-foundation.blog/2018/10/02/how-bosch-is-succeeding-with-open-source/>)

Blockchain technology powers distributed ledgers and smart contracts, allowing the creation of cryptocurrencies like Bitcoin. Yet the most exciting applications for blockchain go beyond cryptocurrency. They are poised to transform entire industries—ranging from security, healthcare, financial services, and supply chain—through a shared platform that decentralizes control over data without compromising the security of sensitive information to help drive greater transparency and trust.

Blockchain technology is tantalizing to any network of organizations that want to record transactions between themselves, but either cannot depend on an intermediary that all parties trust, or that want to make that intermediary more efficient and substitutable.

The Challenge

Delivering on the full promise of blockchain across industries and use cases is only possible with an open source, collaborative effort. No vendor working alone has been able to address enterprise scenarios with widely varied requirements for decentralization, trust, continuity, and confirmation times.

The Approach

The Linux Foundation recognizes the importance of expanding blockchain and advancing it across many industries. In February 2016, Hyperledger was seeded with 30 founding members, some of whom had internal efforts that needed the kind of home that The Linux Foundation could provide. They saw a need within the enterprise market for a flat, distributed, multi-party database ledger and smart contract system separate from cryptocurrencies. Through open source collaboration, this group began building blockchain technology building blocks to enable these types of systems.

Similar to The Linux Foundation, Hyperledger takes a modular, “greenhouse” approach to hosting projects. At the top level, The Linux Foundation and Hyperledger provide the infrastructure for open development to occur. This includes technical, legal, marketing, and organizational support.

Within Hyperledger's greenhouse are several business blockchain frameworks and tools that take different approaches to creating blockchains for business: distributed ledger frameworks, smart contract engines, client libraries, graphical interfaces, utility libraries and sample applications. The overall strategy encourages developers to reuse common building blocks. There are currently five Hyperledger framework projects and a set of five tools.

“The Linux Foundation has achieved an unbelievable feat in bringing together a community of traditionally competitive institutions. To facilitate such extensive collaboration between startups, financial and non-financial corporations and technology giants is an enormous win for the whole distributed ledger industry as firms look to leverage mutually beneficial code for the common good.”

– Blythe Masters, CEO, Digital Asset

The Results

Almost two years later, Hyperledger is the fastest-growing consortium hosted by The Linux Foundation. Built under The Linux Foundation's model of technical governance and open collaboration, individual developers, service and solution providers, government associations, corporate members and end users are contributing in the development and promotion of blockchain technologies for business. Hyperledger brings together organizations and individuals across the globe, industry and competitive lines to establish protocols and standards that improve the performance and reliability of blockchain.

Hyperledger does not see there being one global chain-of-all chains to rule them all. Rather than driving all industries to convert to one chain, the project provides tools for businesses to build their own chains. Precisely how, and the pace at which, each industry adopts blockchain will surely vary. Ultimately, there will be many public chains and millions of private chain distributed ledger systems designed for specific marketplaces. They will interoperate over standards and ideally each use a common base of technology, much like how the Linux community uses the common kernel operating system. Potentially, each will have a different consensus mechanism, preferred smart contract language, and other unique characteristics.

In this environment, Hyperledger serves as a trusted source of innovative, quality-driven open source software development, creating modular components and platforms. Hyperledger is incubating and promoting enterprise-grade, open source business blockchain technologies, on top of which anyone can set up apps to meet their business needs.

By developing common distributed ledger technology that is shared, transparent and decentralized, the possibilities are endless. Much like the Apache web server project drove people to build their own websites, rather than encouraging everyone to just use one big site. The goal for the best-run open source projects is not just to solve some technical problem in an open way, but to be a long-term bedrock foundation for a software ecosystem. This is what the blockchain community needs today, and that's why Hyperledger exists.

More than 200 member companies are backing Hyperledger, spanning several industries, including technology, financial services, manufacturing, supply chain, healthcare, real estate, and retail. Membership in Hyperledger has more than doubled over the past year, with global participation balanced across North America, Asia Pacific, and Europe and the Middle East. More than one-quarter of the project's members are based in China.

2. Case Study: How Community-Based Open Source Works in Life Sciences, and Similarities to Barriers and Solutions on Which OS-Climate is Working

The i2b2 tranSMART Foundation, a major initiative in the Life Sciences sector, illustrates the power of the community-based open source development approach for solving complex challenges.

- Community includes over 200 hospitals and research centers, and thousands of scientists and engineers at more than 300 companies and academic institutions.
- More than 225 curated datasets from public and private sources.
- Proof that collaboration on “pre-competitive” data and tools works -- contributors include large pharma companies like Merck, Pfizer, Roche, and Sanofi, dozens of smaller biotech companies, and major hospitals that compete on precision medicine.
- Results include accelerated development of better diagnostics, drugs, and treatments for breast cancer, ovarian cancer, multiple sclerosis, etc.

The i2b2 tranSMART Foundation combines open data and open source tools around the i2b2, tranSMART and OpenBEL translational research platforms. Its mission is to enable “effective collaboration for precision medicine, through the sharing, integration, standardization, and analysis of heterogeneous data from healthcare and research; through engagement and mobilization of a life sciences focused open-source, open-data community. Its flexible ontology-driven architecture and community developed plugins, APIs and user interfaces enable a variety of configurations to support the needs of data scientists, academic clinical investigators, and industry.”

The i2b2 tranSMART Foundation started in 2017 through the merger two open source initiatives by Johnson and Johnson and the National Institutes of Health. It combined J&J's tranSMART open source data repository and software for support of pre-competitive translational research collaboration, with an NIH-funded informatics framework for using clinical data in drug discovery research and designing targeted therapies.

tranSMART was originally launched in 2009 as a Knowledge Management project to address the problem of finding and accessing data stored in more than 100 databases of various types. University of Michigan, Imperial College London, and others helped develop this for

J&J. The i2b2 (Informatics for Integrating Biology and the Bedside) Foundation was founded in 2005 as an NIH-funded National Center for Biomedical Computing at Harvard. It was originally designed to address the fragmentation of methodologies for clinical research analytics and need for a comprehensive set of software tools.

The participants in both platforms saw the need for improving governance, organizational structures for collaboration, and other key community functions. IBM joined as a partner at the beginning of i2b2 transSMART to address the massive computing and storage challenges both platforms faced.

The Foundation has brought together a wide range of other companies to share in the development of the pre-competitive layer of data and technology while advancing their commercial interests. At the time, the Foundation reported it was being used by about 150 biotech and pharma companies, ranging from startups to industry giants. When the community identified a number of important gaps in the initial combined platforms, Pfizer, Sanofi, Abbvie and Roche came together for a joint project to develop an enhanced version 17.1 of the platform.

i2b2 transSMART shows that the community-based open source approach works not only in Tech but also in Life Sciences. It also shows how closely the approach matches the challenges around data and analytics for climate-integrated investing. The types of problem that drove the research, pharma, and healthcare community to create the i2b2 transSMART Foundation are very similar. The types of solution elements (community infrastructure; pre-competitive layers of data, analytics, and enabling software; means to share the cost of development, computing/storage, etc.) are highly similar to those under development by OS-Climate .

3. Case Study: How Bosch Is Succeeding with Open Source at Eclipse IoT

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How is it that a 150-year-old, 400,000 employee industrial conglomerate is competing and winning in the rapidly involving IoT software industry? We've just published a [case study](#) in which [Bosch](#) shares how open collaboration at the Eclipse Foundation factors into that success. This case study is required reading for any organization considering pursuing an open source strategy.

This case study is yet another proof point that open source has won. No single company can deliver innovation at the pace and scale of open source. For industrial companies in particular,

broadly adopted open technologies and standards are critical for success in the digital economy. It's a case of disrupt or be disrupted — and open source holds the key for rapid and sustainable innovation in the digital age. The team at Bosch recognized all of this several years ago. When the time came for creating an IoT platform for themselves and their customers, Bosch chose open source to compete with proprietary vendors.

At the Eclipse Foundation, Bosch is successfully executing a long-term strategy to create a widely adopted open source platform for IoT. Having previously been a long-term Solutions member of the Eclipse Foundation, Bosch increased its membership level in the Eclipse Foundation to become a Strategic member and joined the Eclipse IoT Working Group in 2015. Beyond IoT, Bosch is an active participant in the Eclipse Foundation's Automotive Industry community.

Some of the highlights from the case study ([html](#)) ([pdf](#)):

- Bosch's leadership in the Eclipse IoT community has helped position the company as a leader in the IoT industry.
- Bosch has created six different IoT open source projects since joining the Eclipse IoT community. In addition, Bosch contributes to many other Eclipse IoT projects.
- Bosch has contributed around 1.5 million lines of code to Eclipse projects. At present, over 60 Bosch developers work on Eclipse IoT projects.
- Many of the [Bosch IoT Suite](#) commercial products are now based on Eclipse IoT projects. The open development process used by the Eclipse projects has been adopted by Bosch Software Innovations' product development teams. The open source development model helps Bosch provide more transparency for their customers, and aids in recruiting new developers keen to work on open source.
- The Eclipse Foundation's clear, vendor-neutral rules for intellectual property sharing and decision-making make it easy to collaborate with other organizations on driving rapid innovation. The Foundation's legal processes provide Bosch with the legal assurance that they can successfully embed open source technology into their commercial products.

We are thrilled that Bosch is seeing the benefits of their open source strategy and participation in the Eclipse community. Thanks to the contributions of Bosch engineers and many other developers within the Eclipse community, all can benefit from runtimes and frameworks creating a [sic] open, vendor-neutral platform for IoT.

To learn more about the Eclipse IoT community, head over to the [Eclipse IoT Working Group website](#).