

HYPERLEDGER

BLOCKCHAIN TECHNOLOGIES FOR BUSINESS

Why Business Needs Blockchain Technologies

Dan O'Prey, CMO



Introducing Hyperledger

Open Source
collaborative effort to
advance cross-
industry blockchain
technologies.

Hosted by
The Linux
Foundation.

Global collaboration
spanning finance,
banking, IoT, supply
chains,
manufacturing and
technology.



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Hyperledger by the Numbers

95

Members

100+

Contributors

6

Projects

2.3K

Membership Requests

5X

More requests than
next largest in LF
history

6

Hackfests

6

Working Groups

<\$6M

Membership
Investment



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The most valuable role Hyperledger can play is to serve as a trusted source of innovative, quality-driven open source software development community;

creating modular, open source components and platforms;

all focused on distributed ledger and smart contract technologies. If Hyperledger can forge a brand that is widely seen as the accepted default ‘safe’ deployment platform for enterprise teams, and be seen as a great home for active collaboration around new technologies, then I think we can say ‘mission accomplished’.

*Brian Behlendorf
Executive Director
Hyperledger*



What Hyperledger is not

Not a single blockchain

Not a cryptocurrency

Not one company's project

Not a one-size fits all solution

Not a consortium

Modular “Umbrella” Approach

Incubator for multiple blockchain projects

Consistent license, Intellectual Property, and standards

Common branding

Encourage interoperable components

Community for technology projects

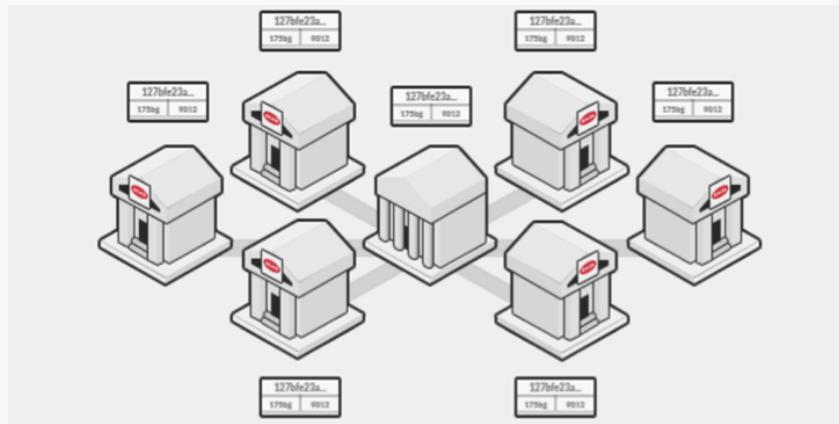


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Why create Hyperledger?

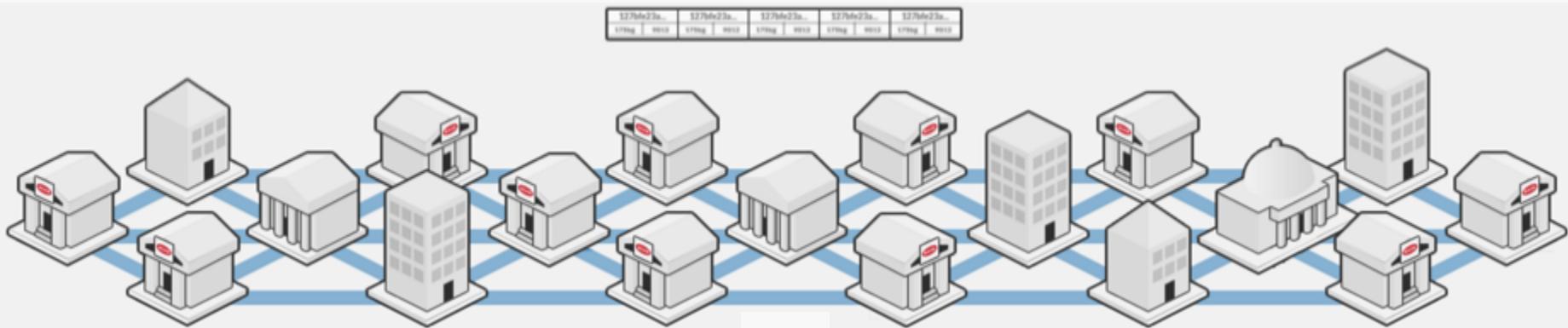
Problem with traditional databases



Problem with traditional databases



The blockchain solution



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**Existing blockchain solutions were not designed
for enterprise usage, they were designed
to cut out all intermediaries**

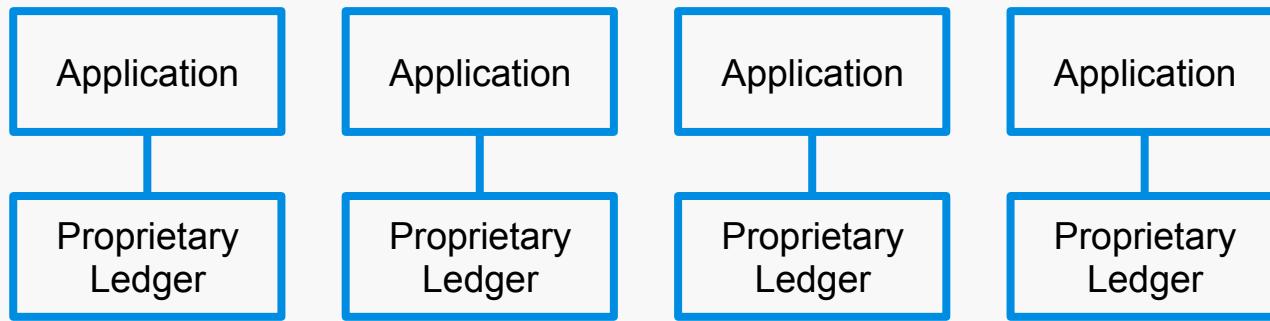


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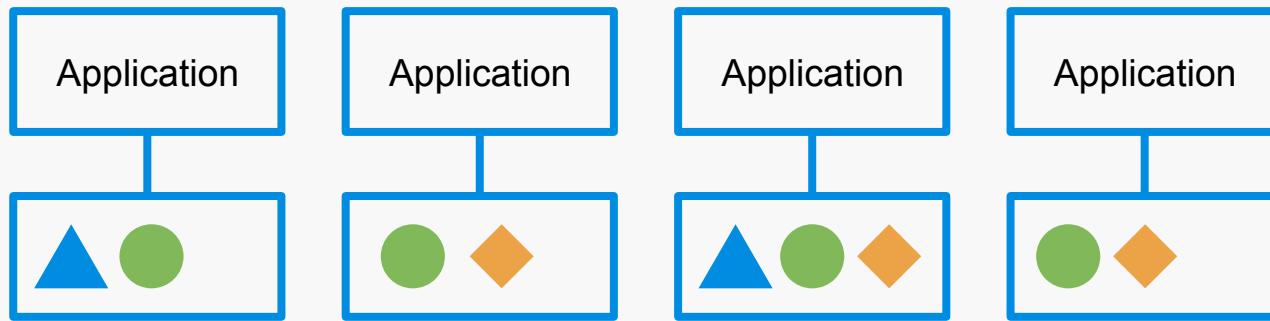
Problems with existing blockchains



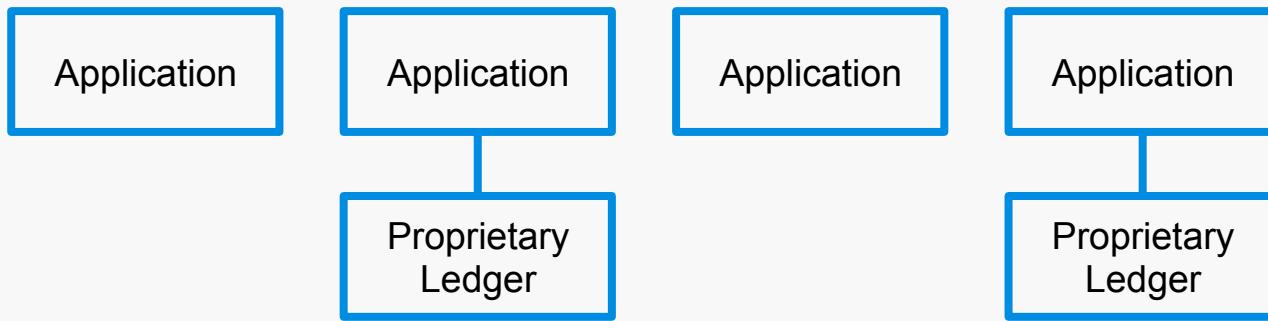
Startups recognized this



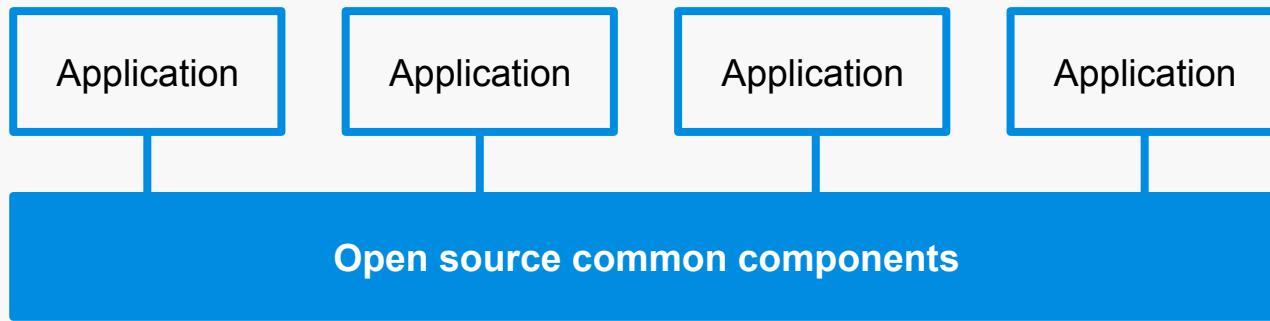
Duplicated work across projects



Users had to bet on winning ledger



Commodity, shared components



Why an open source project?

New, potentially revolutionary technology

Requiring multiple skill sets to develop

Used by multiple parties

Controlled by no one

And so needs a strong governance model



Summary

Be a trusted source of innovative, quality-driven open source software development, creating modular, open source **blockchain components and platforms**.

Build an open source, **technical community** to benefit the ecosystem of Hyperledger solution providers and users, focused on blockchain and shared ledger use cases that will work across a variety of industry solutions.

Promote participation of leading members of the ecosystem, including developers, service and solution providers and end users.

Host the infrastructure for Hyperledger, establishing a neutral home for community infrastructure, meetings, events and collaborative discussions, and providing structure around the business and technical governance of Hyperledger.



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Projects

Project Scope

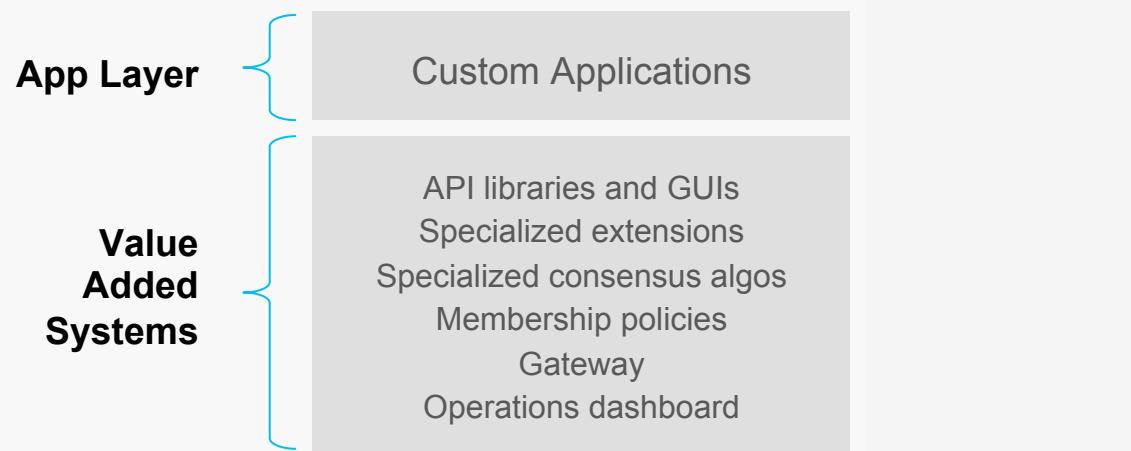
App Layer

Custom Applications

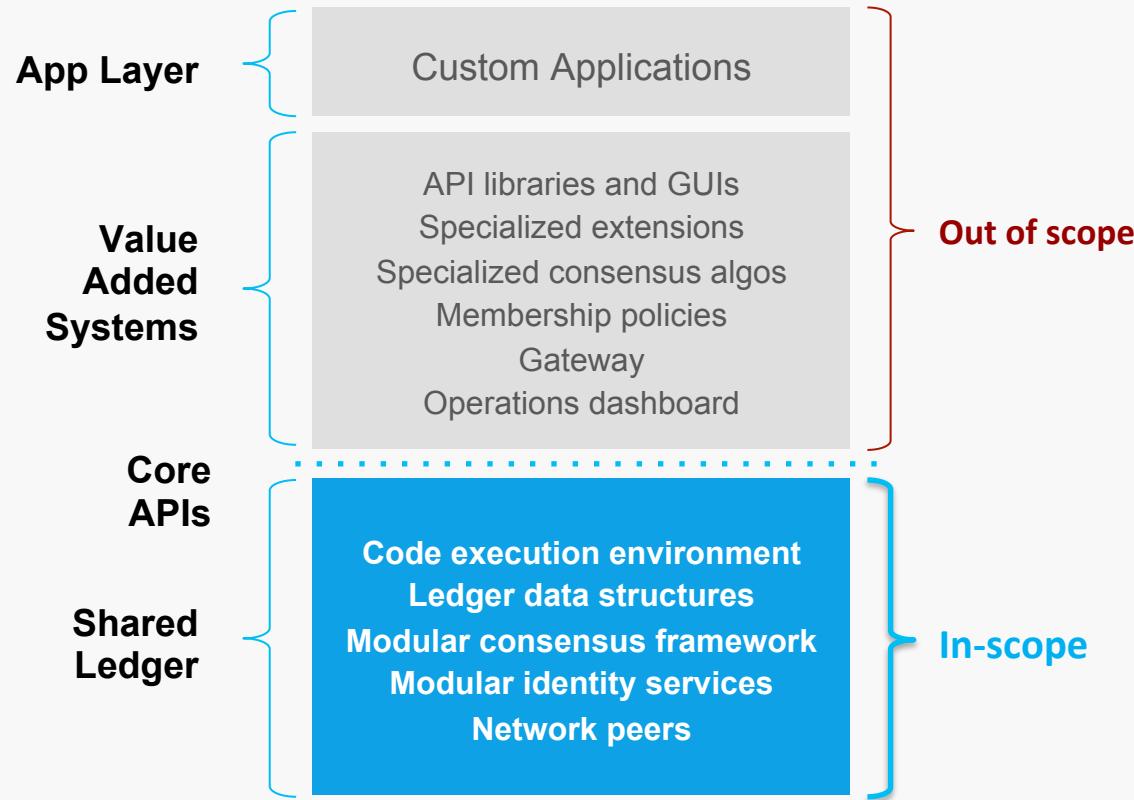


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Project Scope



Project Scope



Hyperledger Fabric

Status - Incubation

Developed by



Fabric

Proposed by



Digital Asset

Use by



UBS

MUFG



HSBC



Bank of America
Merrill Lynch

Walmart

MIZUHO

github.com/hyperledger/fabric



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Hyperledger Fabric - Unique Features

Modular design

Pluggable options

Chaincode for smart contracts

Smart contracts can be written in any language and run in containers

Encrypted transactions

Confidential transactions are encrypted for parties not involved

Hyperledger Sawtooth Lake

Status - Incubation

**Sawtooth
Lake**

Developed by



Proposed by



Hyperledger Sawtooth Lake - Unique Features

New consensus algorithm

Proof-of-Elapsed-Time (PoET) as an optional plug-in

Decoupled ledger from transactions

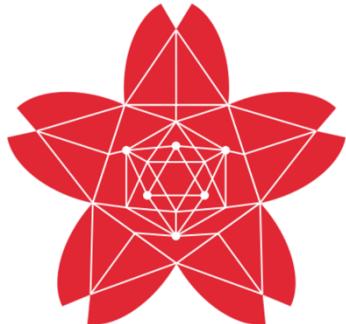
Modular design

Transaction families concept

Extensible across business domains

Hyperledger Iroha

Status - Incubation



IROHA

Developed by



Proposed by

HITACHI **NTT DATA** **colu.**

Use by



みずほ情報総研



Hyperledger Iroha - Unique Features

New consensus algorithm

Chain-based BFT algorithm: Sumeragi

Mobile app and JavaScript libraries

Attain transaction finality within 2 seconds

Tools for creating digital assets

Special transaction types for asset creation without chaincode

Hyperledger Corda

Corda

Status - Intended Proposal

Developed by



Proposed by

Submitting early December

Use by

R3's consortium of ~70 banks

Hyperledger Corda - Unique Features

Designed with financial institutions

For use in regulated markets

Consensus only done by parties to transaction

Can support other consensus like PBFT

Standard enterprise tooling

Written in Kotlin, a Java compatible language that runs on the JVM



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Use Cases and Proof of Concepts

FX Netting and Settlement



Geneva-based CLS is building a **Foreign Exchange** (FX) payment netting service using **Hyperledger Fabric**. CLS is one of the founding members of the open source Hyperledger project which takes advantage of blockchain technology. With the help of IBM, CLS is building a settlement system for FX trades that are settled outside of the existing CLS settlement service.

14 banks and financial institutions have already signed up for this service. It will enable them to submit FX instructions for **six different products**. When the product launches CLS will support **24 different currencies**. This includes the 18 currencies it already offers customers support for along with six new currencies.



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Trade Finance



Swiss banking giant UBS has unveiled a project designed to replicate the entire **lifecycle of an international trade** transaction on **Hyperledger's Fabric** blockchain.

Built in collaboration with IBM, the **trade finance** project is still in its earliest stages, but it's arguably already more ambitious than many blockchain prototypes that focus on just a single aspect of the process. Designed to "holistically" combine payment transactions, the prototype merges trade finance transactions, foreign exchange payments and more, into one single, elaborate **smart contract**.

Trade Finance



Bank of America Merrill Lynch, HSBC and the Infocomm Development Authority of Singapore (IDA) are using a blockchain prototype to streamline the paper-heavy world of **global trade**. The consortium used the Linux Foundation open source **Hyperledger Project blockchain fabric**, supported by IBM Research and IBM Global Business Services.

The application mirrors a paper-intensive **Letter of Credit** (LC) transaction by sharing information between exporters, importers and their respective banks on a private distributed ledger. This then enables them to execute a trade deal automatically through a series of digital **smart contracts**, said a statement.

Loyalty Points



[IBM](#) said on Friday it completed a pilot project with Chinese credit card company China UnionPay that will facilitate the **sharing of loyalty bonus points** among banks using block chain technology.

IBM's collaboration with China UnionPay will enable consumers worldwide to exchange **bonus points from their various banks in less than a minute** to select rewards they want.



Automated Transactions



The Hyperledger project is bearing fruits. Two participating companies in the Hyperledger Project, [IBM](#) and Bank of Tokyo-Mitsubishi UFJ have signed a contract to develop and use blockchain technology.

A [press release](#) in this regard, issued by IBM, states that both the companies will be working together on **automating inter-business transactions** from next year. The project, built on [Hyperledger Project Fabric](#) – a Linux Foundation initiative will be implemented on a pilot scale for a period of one year. Based on the success of the jointly developed blockchain prototype built on IBM Cloud, they may offer it to other businesses in the future.

Stock Trading and Settlement



IBM and Japan Exchange Group (JPX) announced an agreement to test the potential of blockchain technology for use in **trading in low transaction markets**.

IBM will work with JPX to jointly evaluate how the IBM open source blockchain code, that has been proposed to the Linux Foundation's **Hyperledger Project**, could be used for **trading and settlement** in low liquidity markets. As the Hyperledger Project evolves, the joint IBM and JPX evaluation work will transition to use of the code produced by that effort.

Currency Swap Settlement



Japanese banking giant Mizuho Financial Group and technology firm IBM have announced a partnership to test blockchain technology used in settlements with virtual currencies, using code from the Linux Foundation-led [Hyperledger project](#).

Mizuho Financial Group, a prominent Japanese banking group that is notable for its blockchain-based endeavors with previous efforts such as a partnership with consulting firm Cognizant to build blockchain solutions for record keeping has revealed a new blockchain project with tech giant IBM.

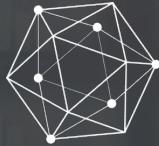
In a recent announcement, the Japanese financial group revealed a blockchain test with IBM, using the technology for [instantaneous swaps of virtual currencies](#).

Supply chain management



Hyperledger Healthcare Working Group





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Community

Community and Ecosystem Engagement

Brian Behlendorf keynoting multiple events across the globe with Hyperledger exhibition at key events in 2016.

hyperledger.org/news/events

Global Meetup structure to launch in 2H '16 to organize grass-roots engagement.

Active engagement with technology and finance journalists and analysts to continue educating the market on Hyperledger.

hyperledger.org/news

Technical Steering Committee hosts regular online and face-to-face hackathons – join our mailing lists to learn about these and other technical activities. hyperledger.org/community



Membership Levels

Premier

- 13** Members
- 16** Maximum
- 1** Board Rep
- 1** TSC Rep (First 6 months)
- 1** Voting Marketing Rep

General

- 78** Members
- No** Maximum
- Vote** on a Board Rep
- 1** Non-voting Marketing Rep

Associate

Associate Membership is free for non-profits and open source projects



Hyperledger Premier Members



Hyperledger General Members



Hyperledger Associate Members



Growing Japanese Membership



Orchestrating a brighter world



Global IT Innovator



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Join Hyperledger!

Ensure the strength and longevity of a core technology to your business.

Publicly proclaim your leadership in the blockchain space.

Work with other blockchain leaders to develop and promote Hyperledger.

Visit hyperledger.org/about/join
or email info@hyperledger.org





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Learn more at hyperledger.org



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Hyperledger Team and Leadership

Hyperledger Staff



Brian Behlendorf
EXECUTIVE DIRECTOR



Todd Benzie
SR. PROGRAM MANAGER



Greg Wallace
DIRECTOR OF MARKETING



Ray George
SENIOR DIRECTOR OF PR



Jessica Rampen
SR. PR MANAGER



Min Yu
CLIENT SERVICES COORDINATOR



Ry Jones
RELEASE ENGINEER



Rebecca Goldberg
MEETING AND EVENT PLANNER

Brian Behlendorf, Executive Director

Behlendorf was a primary developer of the Apache Web server, the most popular web server software on the Internet, and a founding member of the Apache Software Foundation. He has also served on the board of the Mozilla Foundation since 2003 and the Electronic Frontier Foundation since 2013. He was the founding CTO of CollabNet and CTO of the World Economic Forum. Most recently, Behlendorf was a managing director at Mithril Capital Management LLC, a global technology investment firm.



Hyperledger Governing Board



Blythe Masters
GOVERNING BOARD CHAIR



Chris Ferris
TSC CHAIR



Chad Cascarilla



Charles Cai



Craig Young



Dan Middleton



Dave Treat



Jerry Cuomo



Kireeti Reddy



Robert Palatnick



Stefan Teis



Thierry Chevalier



Todd McDonald



Toshiya Cho



Umar Farooq



Yoshinobu Sawano

Hyperledger Technical Steering Committee



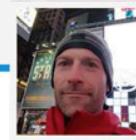
Arnaud Le Hors



Binh Nguyen



Chris Ferris



Dan Middleton



Greg Haskins



Hart Montgomery



Mic Bowman



Murali Katipalli



Richard Brown



Sheehan Anderson



Tamás Blummer



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Media and Community

Press Coverage

W I R E D

Tech and Banking
Giants Ditch Bitcoin
for Their Own
Blockchain

International Business Times.

Linux Foundation's
Hyperledger Project
trumpets code
contributions from
across 30 founder
members

FINANCIAL NEWS

Another day, another
blockchain consortium
update –
this time from the
Hyperledger Project

FORTUNE

IBM, J.P. Morgan, and
Others Build a New
Blockchain for
Business



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The Linux Foundation® is the organization of choice for the world's top developers and companies to build ecosystems that accelerate open technology development and commercial adoption. Together with the worldwide open source community, it is solving the hardest technology problems by creating the largest shared technology investment in history. Founded in 2000, The Linux Foundation today provides tools, training and events to scale any open source project, which together deliver an economic impact not achievable by any one company.

The Linux Foundation has **16 years** experience of providing **governance structure** and infrastructure to support the development of large scale, successful open source projects such as:

