Hyperledger Fabric vs. R3 Corda

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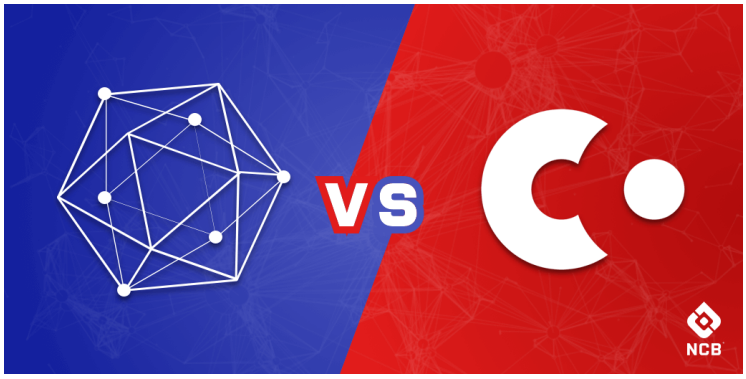

The purpose of this paper is to serve merely as a reference point for comparison between two of the leading Distributed Ledger Technology platforms, namely Hyperledger Fabric and R3 Corda. Hyperledger is part of a multi-project effort, hosted by The Linux Foundation and originally sourced by IBM, while Corda is the main product of the R3 consortium. One aims to interconnect a number of different business sectors, while the other takes adoption among financial institutions as a global independent network.

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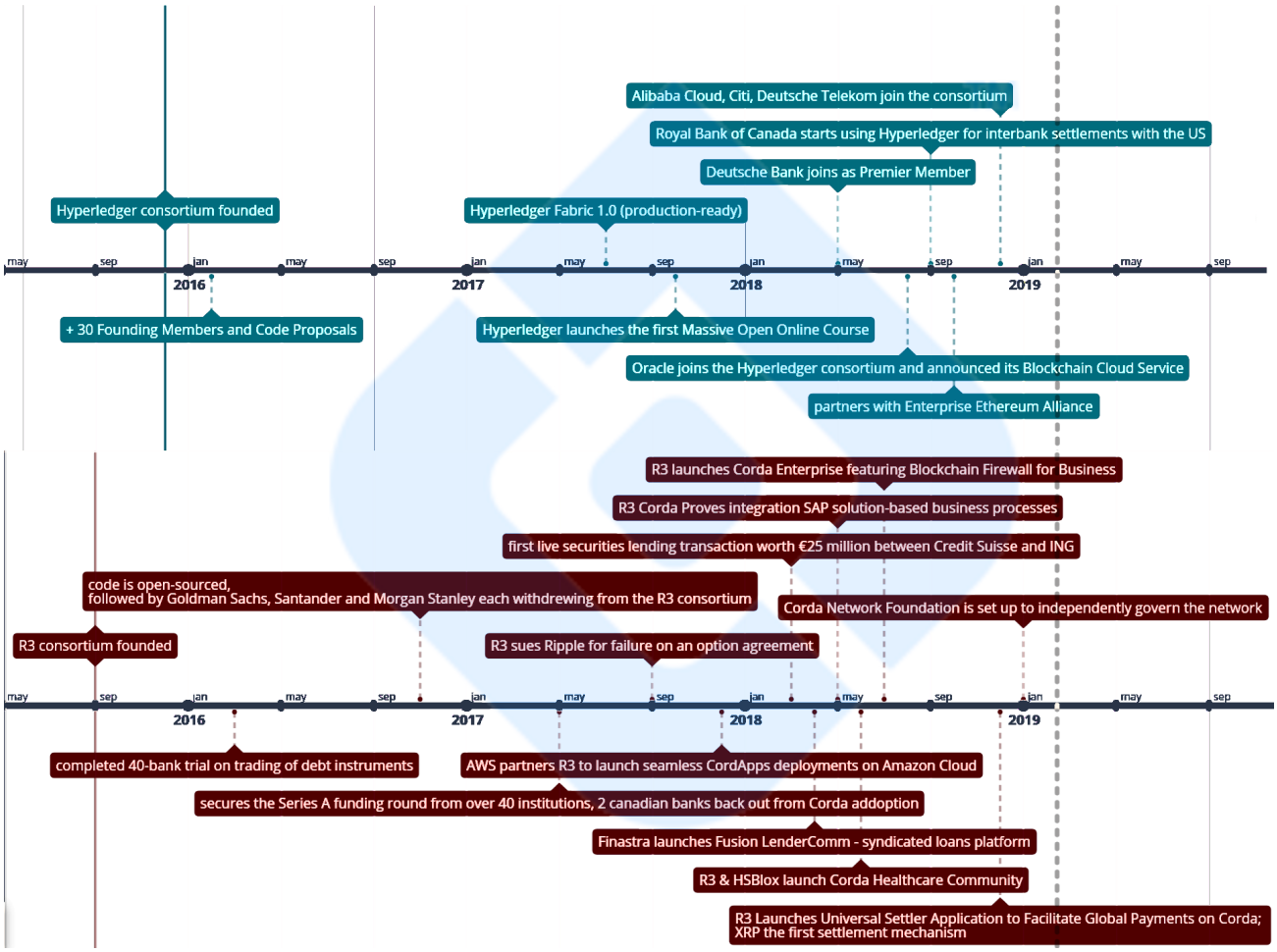
Historical Timelines

How it started.

Let’s first take a look at the historical timelines of both vendors to get an overall idea of how they’re competing.



Hyperledger vs. Corda Development till 2019

What's obvious here is the industry's interest towards flexible DLT solutions. Timelines don't differ very much, which is hardly surprising since both follow the trend on blockchain adoption set by Ethereum. Only these two appear to have more of a B2B targeting. Another interesting thing to note here is that 2017 gave the opportunity to big vendors –as these two– to become cloud-oriented by technology adoptions from Oracle & AWS, thus giving birth to the term *Blockchain-As-A-Service*.

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Technical Timelines

A step further.

Both vendors have a lot more on the table than simply the ability to create a cryptocurrency. Actually, one could say that they're far enough from the crypto community since both focus on private blockchains, but that wouldn't be entirely true. After all, there are similar projects among popular cryptocurrencies as well, regarding privacy and consensus.

Here are the most notable parts of the two development roadmaps:

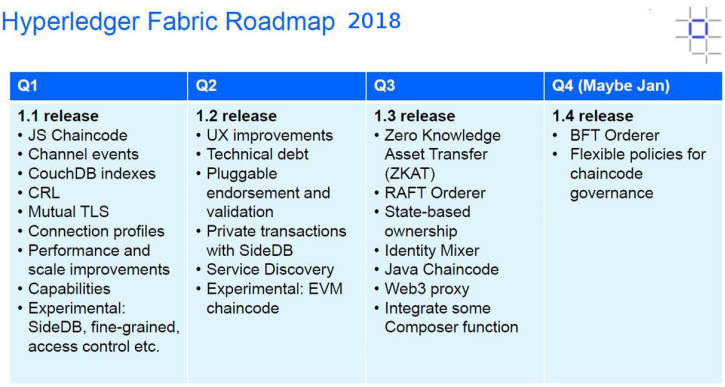

Image by https://www.slideshare.net/alehors

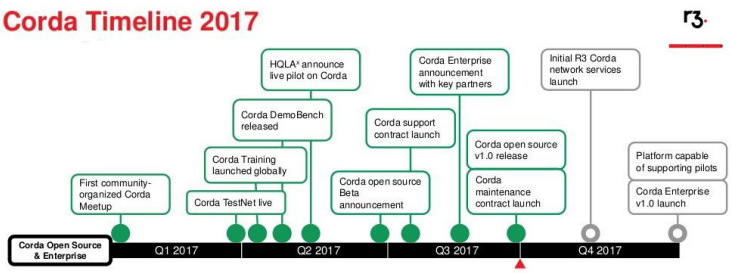

Image by https://r3.com/

Here we see the Hyperledger's Fabric Roadmap for 2018 and the slightly less pre-announced one of R3's Corda for 2017. In this section, instead of comparing timelines, we could focus on different features the two implement, as well as overall density of development for the given one year time frame.

Our research aims to gain maximum insight, so those are hardly all the key points to take away from a development perspective, especially for they are not in the same format and from the same time period.

We could presume that the production cycles of the two follow different methodologies, hence the difference in presentation. As we figure that the R3 only targets the financial sector, it appears normal that Corda doesn't have as big a roadmap announcement as would a similar product hosted for the business sector. There are, however, other applications on top of Corda that are not strictly bank-related, such as the Cordite project.

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Comparison of technical & semantic concepts

The scales at work.

Since we've seen the two projects bathe in the same fountain, let's take a look at how they've got their concepts. There surely are some features relevant to one and not the other, so this review is only targeting the ones relevant to each other.

Similarities

Both platforms display distinguished abilities for integrating with, or more notably — design B2B solutions.

- Permissioned — *always*
- Open Source — *the right choice*
- X.509 certificate standard — *the better choice*
- Pluggable consensus (*pBFT*) — *the logical choice*
- *Java could be used for both — the preferred choice*

Different concept/module implementations

The following table maps a number of different aspects of the two DLT solutions that are carried out using different concepts.

Mapping of similar concepts between Hyperledger Fabric (1.0) and R3 Corda (3.0)

Differences

As mentioned, there are some concepts that are only relevant to one of the projects, not the other, so we're still looking at the ones that we can compare:

- **Platform**: Linux **vs** Multiplatform
- **Virtualization**: Docker **vs** JVM
- **Permissioning**: `ACL` + `Channel`s **vs** Private State `Vaults`
- **Contracts**: `Chaincode` + State DB
  vs `Flows` + `States` + State `Constraints`
- **Currency**: `Assets` **vs** `Cash`

> *An HLF* `Asset` *can be modeled to act as either currency or commodity, whereas Corda's* `Cash` *acts as an actual currency, being in an early stage of configurability.*
>
> ***Concurrency*** *could not qualify to take a place in this comparison. It is however subject to some other articles. There appear to be* ***different***

> ***standards*** *as of which measurements are taken since* **TPS is only relevant when compared against a transaction of a similar nature on an identical set of constraints**. *What we know for certain is that the more private a distributed ledger gets, the higher the likelihood of processing only relevant transactions, thus achieving higher results on a benchmark of this nature.*

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Use cases

Here are some solution examples for both platforms, just to get a slight clue on where they're going:

Hyperledger Fabric

- Assets Lifecycle / Supply Chain applications
- Airlines or Travel agencies record keeping
- Any derivatives of a Bond asset network / Finance aplication
- etc.

R3 Corda

- Loan / Finance applications
- Insurance applications
- Healthcare record keeping
- etc.

You could explore in more detail what else is targeted by one platform or the other.

Production Ready?

Depending on the MVP, production readiness of the two products is assessed differently, so here are the main qualities we would vouch for in our decision:

- **Flexibility** — that should be the overall capability of the product to implement many possible solutions in a clean, unobtrusive fashion.
- **Maintainability** — that would be the ease of having continuous integration with the product without disrupting any in place solutions.
- **Security** — to start with stability, through levels of data safekeeping and operability limitations, there are different aspects in which security is measured, but the overall quality of it should be measured by having all of these right out of the box.

Real-life Adoption

Finally, here are some actual adoptions of the two platforms:

Hyperledger Fabric

- CLS trusted market solutions

- IBM Watson Health
- London Stock Exchange Group
- TenneT Energy Community
- SAP
- etc.

R3 Corda

- Interest Rate Swap
- Project Vega: Shared SIMM Calculations
- Bank of Canada
- HQLAX
- etc.

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Conclusion

These two DLT projects are pretty similar to stray too far away from each other. There is no right choice when it comes to deciding which platform is more promising. It would like the “red pill, blue pill” paradox, unless you have a clear vision on what exact artifacts and scenarios you’d need to incorporate. Hyperledger Fabric has modular design, so it’s pretty configurable and should be able to satisfy a number of requirements. R3 Corda on the other hand leverages industry-standard protocols, thus ensuring seamless integration with a variety of tools for operating the JVM, so its potential is virtually limitless. It was however designed for specifically for financial systems so it offers more customized experience. Both have emerged with the crypto tide are still young enough to secure a stable production cycle.

> More info on both technologies by detailed Hyperledger & Corda NCB slides here.

TK: Move presentations on SlideShare

References:

> *https://en.wikipedia.org/wiki/R3_(company)#History*
> *https://en.wikipedia.org/wiki/Hyperledger#History_and_aims*
> *https://www.hyperledger.org/announcements*
> *https://www.slideshare.net/alehors/hyperledger-fabric-update-june-2018*
> *https://www.r3.com/wp-content/uploads/2018/04/HQLAx-ENG.pdf*
> *https://docs.corda.net/releases/release-M7.0/data-model.html#comparison-with-bitcoin*
> *https://media.consensys.net/blockchain-vs-distributed-ledger-technologies-1e0289a87b16*
> *https://medium.com/@micobo/technical-difference-between-ethereum-hyperledger-fabric-and-r3-corda-5a58d0a6e347*
> *https://101blockchains.com/hyperledger-vs-corda-r3-vs-ethereum/*
> *https://bornonjuly4.me/2017/04/05/enterprise-blockchain-consortiums-part-1/*

> *https://bornonjuly4.me/2017/04/10/enterprise-blockchain-consortiums-part-2/*
> *https://www.corda.net/discover/industry.html*
> *https://www.ledgerinsights.com/r3-corda-blockchain-insurance/*

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