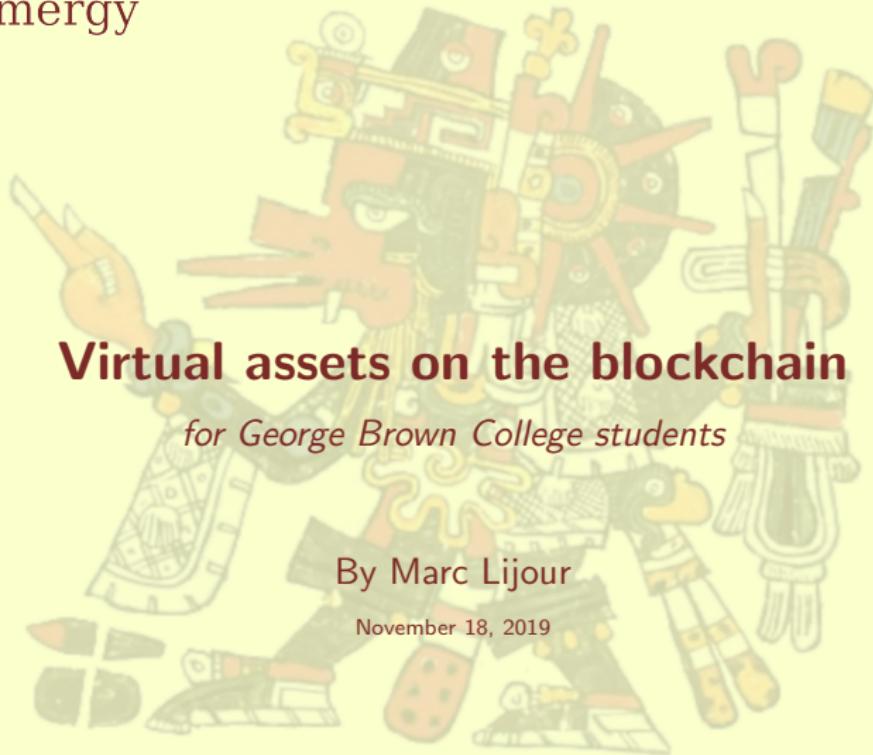




Creative
Emergy



Virtual assets on the blockchain

for George Brown College students

By Marc Lijour

November 18, 2019

The Art and Science of Eternal Blossom

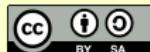


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Intellectual Property Rights (and constraints)

- Copyright
- Patents
- Trademark
- Trade Secrets



What's (un)fair with APIs

- *Oracle America, Inc. v. Google, Inc.* took us for a ride (2012–2016), see Wikipedia's article in the reference section
- the US Court of Appeal for the Federal Circuit found that **APIs are copyrightable** (2018)
- *fair use* does not apply for Java in Android
- in 2016 Google ships OpenJDK Java libraries licensed under GPLv2, starting with Android Nougat (Google)



Patents and the future of Intelligence

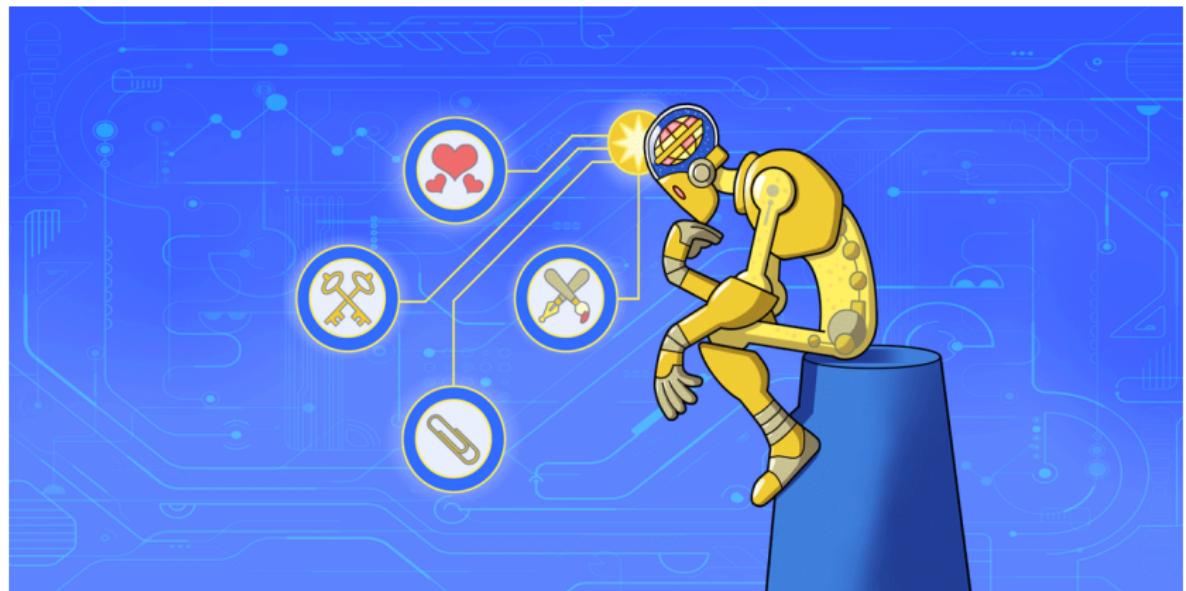


Figure: The Electronic Frontier Foundation (EFF) questions whether patents will slow down innovations in AI (2017) –credit: EFF



Elon Musk does not want to block Innovation



Figure: Tesla promises not to enforce patents (Musk, 2014) –credit: Steve Jurvetson



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A fight starting because of a Printer

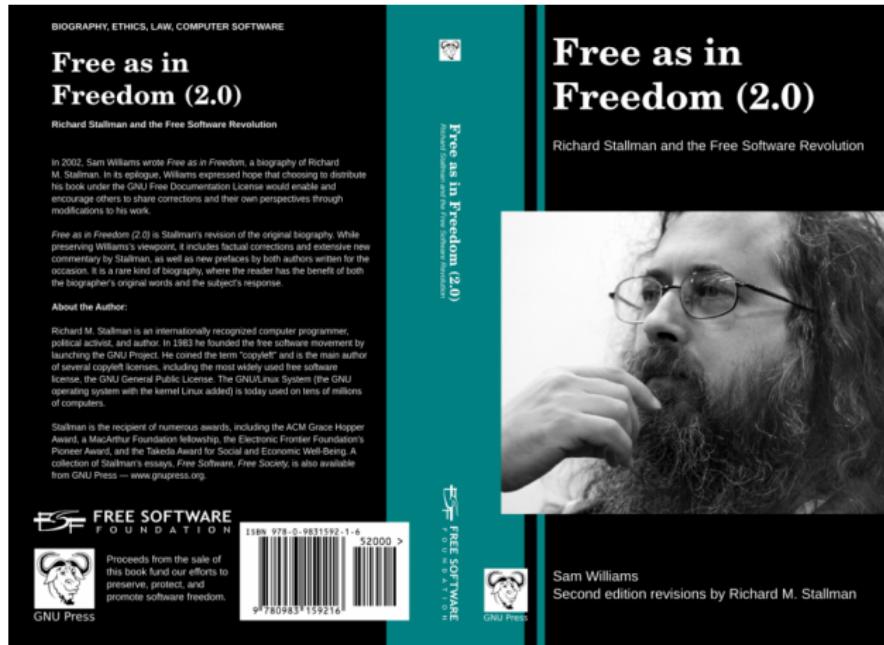


Figure: Richard Stallman's first step into Free Software (Williams, 2002; Williams and Stallman, 2010)



The Four Freedoms

Freedom 0

"The freedom to run the program, for any purpose"

Freedom 1

"The freedom to study how the program works, and adapt it to your needs"

Freedom 2

"The freedom to redistribute copies so you can help your neighbor"

Freedom 3

"The freedom to improve the program, and release your improvements to the public, so that the whole community benefits"



Open Source runs (almost) Everything

2015 was an inflection point

<https://www.blackducksoftware.com/future-of-open-source>

WIRED Open Source Software Went Nuclear This Year
CADE METZ BUSINESS 12.27.15 7:00 AM

OPEN SOURCE SOFTWARE WENT NUCLEAR THIS YEAR

OVER THE NEXT 2 – 3 YEARS...

88% TO INCREASE OPEN SOURCE CONTRIBUTIONS **61%** EXPECT SECURITY OF OPEN SOURCE TO RISE

EXPECTED TO BE IMPACTED MOST:

Technology	Percentage
CLOUD COMPUTING	39%
BIG DATA	35%
OPERATING SYSTEMS	33%
INTERNET of THINGS	31%

HOW & WHY COMPANIES ARE USING OPEN SOURCE

The 2015 Future of Open Source Survey finds

78% OF COMPANIES RUN ON OPEN SOURCE
(nearly double since 2010) &

64% PARTICIPATE IN OPEN SOURCE PROJECTS,
yet many still lack formal policies and processes to manage potential open source-related security, operational, and legal risks.

66% OF COMPANIES BUILD CUSTOMER SOFTWARE ON OPEN SOURCE

OPEN SOURCE USE & PARTICIPATION HAS REACHED AN ALL-TIME HIGH

93% OPEN SOURCE USE INCREASED OR STAYED THE SAME

5% UNSURE

28% SAME

65% INCREASED

2% DECREASED

Building complex large-scale software systems (fast)

An introduction to Free/Libre Open Source Software (Intel, 2014)

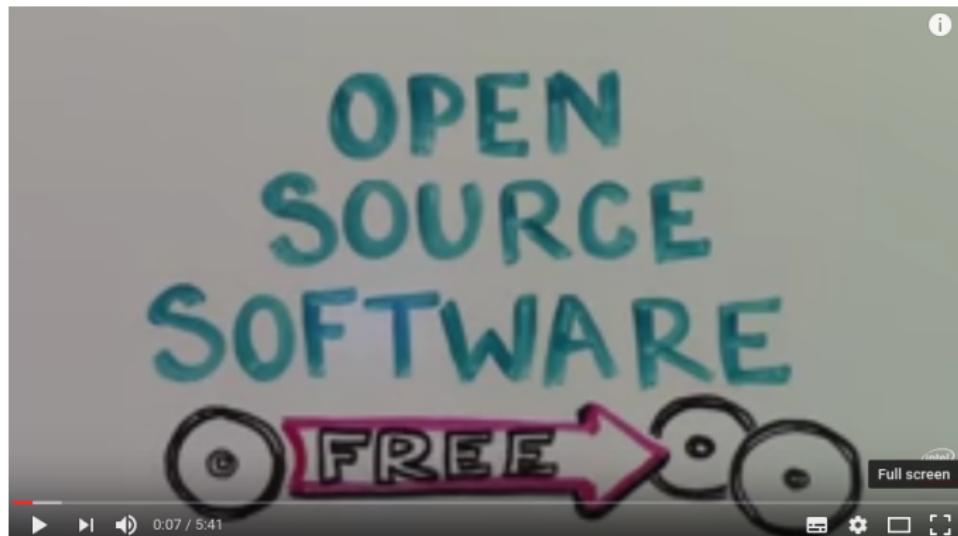


Figure: <https://www.youtube.com/watch?v=Tyd0FO0tko8>

©Intel Software (2014)



Nadia Eghbal's report (2016)

Roads and Bridges: The Unseen Labor Behind Our Digital Infrastructure

Roads and Bridges:

The Unseen Labor Behind
Our Digital Infrastructure

BY NADIA EGHBAL

- Open Source Software runs core infrastructure services
- It is poorly funded (e.g. OpenSSL)
- Who should fund roads and bridges?



Blockchain is Open/Free by design

The screenshot shows the GitHub repository page for 'bitcoin / bitcoin'. The top navigation bar includes links for 'Pull requests', 'Issues', 'Marketplace', and 'Explore'. Below the header, the repository name 'bitcoin / bitcoin' is displayed, along with statistics: 2,811 commits, 26,438 stars, 15,439 forks, and 574 issues. A 'Watch' button is also present. The main content area shows the repository's landing page with sections for 'Code', 'Issues', 'Pull requests', 'Projects', and 'Insights'. A note indicates it's the 'Bitcoin Core integration/staging tree' with a download link: <https://bitcoin.org/en/download>. Below this, there are tags: 'bitcoin', 'c-plus-plus', 'p2p', 'cryptocurrency', and 'cryptography'. At the bottom, metrics show 15,951 commits, 9 branches, 186 releases, 504 contributors, and the MIT license.

License

Bitcoin Core is released under the terms of the MIT license. See [COPYING](#) for more information or see <https://opensource.org/licenses/MIT>.



Starting your own Free/Libre Open Source Software project

Nicely summarized by Roberto Di Cosmo (2015)

Martin Michlmayr (former Debian project leader) studied successful FOSS projects (see <http://opensource.mit.edu>).

They all show a similar pattern of evolution.

Cathedral phase	Transition phase	Bazaar phase
Original "idea" Project Author Core developers Unix philosophy	"Interest" ⇒ Prototype <i>Modular design</i>	Distributed development environment Community Parallel perfective and corrective maintenance Peer reviews

The transition does not come for free!



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- Identify a need



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- Build a prototype
- Grow a community



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The transition does not come for free!

- Identify a need
- Build a prototype
- Grow a community
- Set up an ecosystem
 - (users, developers, architects, designers, service providers...)



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Top industries and blockchain use-cases

According to IDC (2018)

- financial sector (\$552 million in 2018) –custody and asset tracking, trade finance, in addition to cross-border payments and settlements
- distribution and services sector (\$379 million in 2018) –asset/goods management and lot lineage/provenance
- manufacturing and resources sector (\$334 million in 2018) –as above



Market size for blockchain applications



Source: IDC Worldwide Semiannual Blockchain Spending Guide, 2017H2

Figure: from IDC (2018)



Top advantages per industry

Top advantages per industry



	Automotive	Banking	Comms & media	Consumer goods & services	Energy	Healthcare	High tech	Insurance	Public service	Retail	Software & platforms	Travel	Utilities	
1	Full traceability of any information on the blockchain	7	2	4	3	1	1	3	1	3	1	6	1	4
2	Ability to ensure data has not been tampered with	4	1	1	3	4	2	1	2	1	5	2	2	4
3	Distributed nature of the technology	8	4	5	1	8	4	3	3	4	6	4	3	6
4	Smart contracts and automation	2	3	2	2	5	5	6	4	6	3	3	6	3
5	Increased speed and efficiency	3	6	2	5	3	7	7	7	2	4	5	5	1
6	Increased security	1	6	7	7	2	3	1	5	4	2	1	3	2
7	A holistic view with transparency for all appropriate parties	5	5	6	6	5	6	5	5	6	7	7	7	7
8	New business products or services	6	8	8	8	7	8	8	8	8	7	7	8	8

Data Source: "Building Value with Blockchain" survey

Figure: from the World Economic Forum (2019)



WEF's Blockchain Value Framework

Blockchain Value Framework

KEY DIMENSIONS	<input checked="" type="checkbox"/>	Improving profitability and quality			<input type="checkbox"/>	Increasing transparency among parties		<input type="checkbox"/>	Reinventing products and processes	
CAPABILITIES	Automation Self-validating network + smart contracts enable auto execution of business rules.	Control Control at the individual data element level, maximum flexibility over what data is shared and how.	Distributed No single-entity data ownership, consensus applied to transactions and shared access with no central point of failure.	DAx (Decentralized Autonomous x) Transparent, predefined rules mean new ventures may be created, providing autonomous products/services through decentralized model.						
	Full traceability Provenance and complete history of all new data added is known.	Security Data can be encrypted and segregated at the data element level, while also enhancing overall data security.	Holistic view Single source of truth - all stakeholders see the same information to which they have access.	Enhanced identity A combination of capabilities with advancements in digital identity (e.g. biometrics) increase confidence in, and improvement of, security and management of customer and personal identity data.						
	Speed efficiency Can enable faster data transfer, streamline tasks to optimize process efficiency, particularly where intermediaries have been removed.	Evidence tampering Underlying mathematics and cryptography allow users with appropriate access to verify data has not been altered.		Tokenization and digital assets Physical objects with verified unique digital representation enable digital ownership, management and transfer.						
VALUE DRIVERS	Auditability	Compliance	Data management	Data security	Data sharing	Resiliency	Authentication	Identity management		
	Ownership	Payments	Process automation	Reconciliation	Transparency	Trust	Marketplace creation	New enhanced products and services		New expanded partnerships

Figure: from the World Economic Forum (2019)



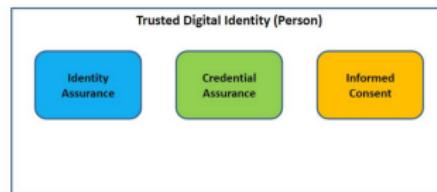
Pan-Canadian Trust Framework — Cadre de Confiance pancanadien

<https://canada-ca.github.io/PCTF-CCP/>

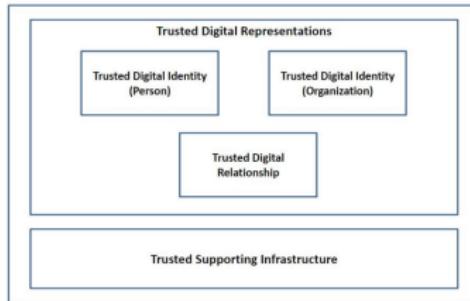
PCTF-CCP

Pan-Canadian Trust Framework | Cadre de Confiance Pancanadien

[View the Project on GitHub](#)
canada-ca/PCTF-CCP



The Pan-Canadian Trust Framework



uPort



uPort stack vs ERC-725

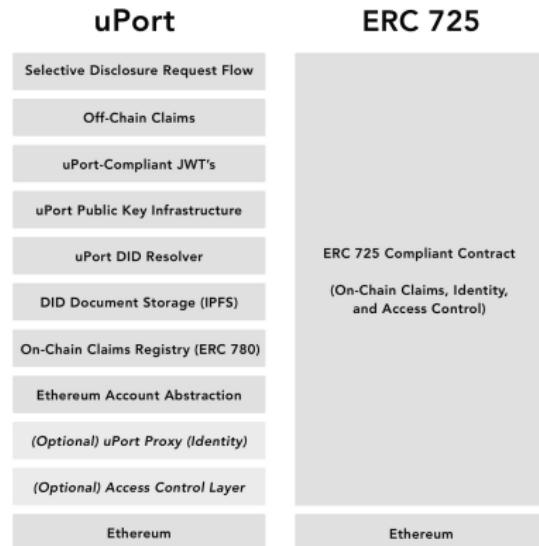


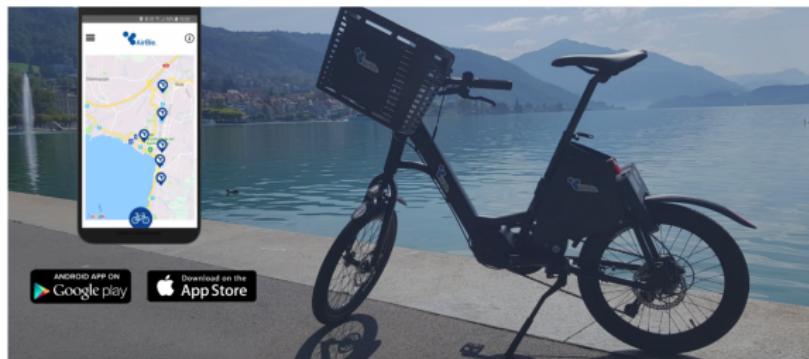
Figure: from Braendgaard, 2018



The first e-bike service worldwide powered by decentralized identity

See full article from Nawfal, 2018

AirBie, a crypto bike-sharing service, just launched the first e-bike service worldwide powered by decentralized identity



Last November, the Swiss city of Zug officially launched its Zug eID, an opportunity for its residents to register for a decentralized, digital identity powered by uPort.

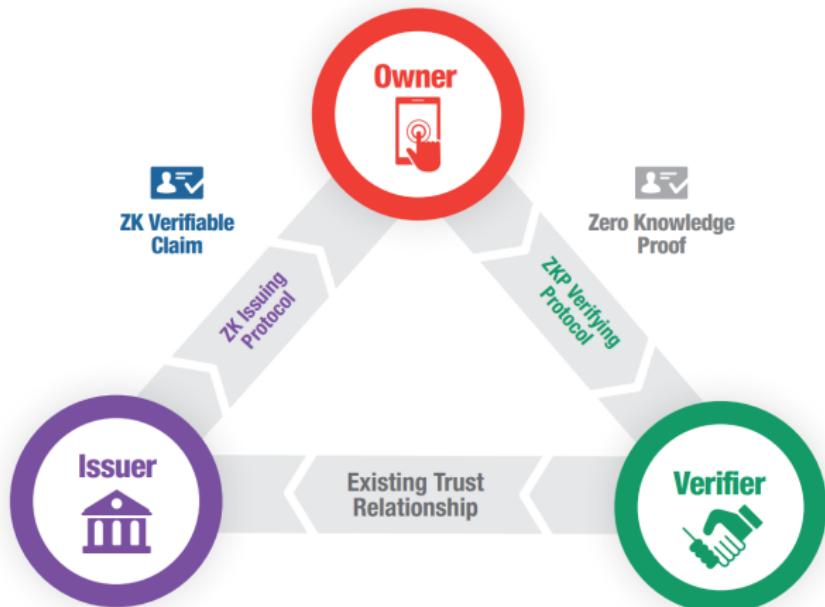


Sovrin – Hyperledger Indy



Self-Sovereign Identity

Extract from the white paper from The Sovrin Foundation, 2018



The Verifiable Organizations Network (VON)

<https://vonx.io>

The screenshot shows the homepage of the VON website. At the top left is the VON logo, which consists of a stylized network icon followed by the acronym "VON" and the full name "Verifiable Organizations Network". At the top right are three navigation links: "About", "Get Started", and "Clicky Things". The main title "Verifiable Organizations Network: Global digital trust for organizations" is centered in large white font. Below the title are two buttons: "Learn More About VON" and "Get Involved". Further down, there is a section titled "Founding community partners" featuring logos for British Columbia, Public Services and Procurement Canada, and Ontario.

VON
Verifiable Organizations Network

About Get Started Clicky Things

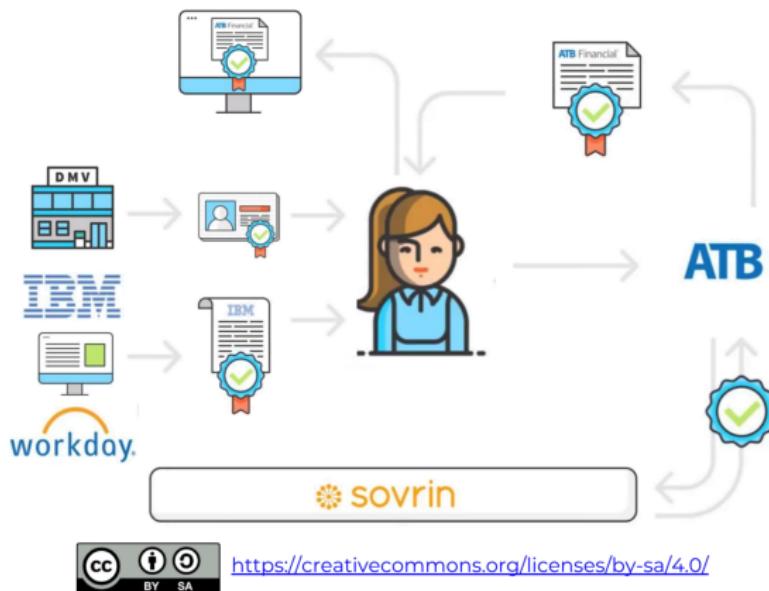
Verifiable Organizations Network: Global digital trust for organizations

Learn More About VON — or — Get Involved

Founding community partners

BRITISH COLUMBIA Public Services and Procurement Canada Ontario

SSI in Alberta



PoC: ATB, Evernym, IBM, Workday:

- Issuing Employment and Drivers License creds
- Sharing with ATB for account opening
- Issuing of Bank account cred

Demonstrating controller/processor employment cred, bank account opening, and account login



<https://creativecommons.org/licenses/by-sa/4.0/>

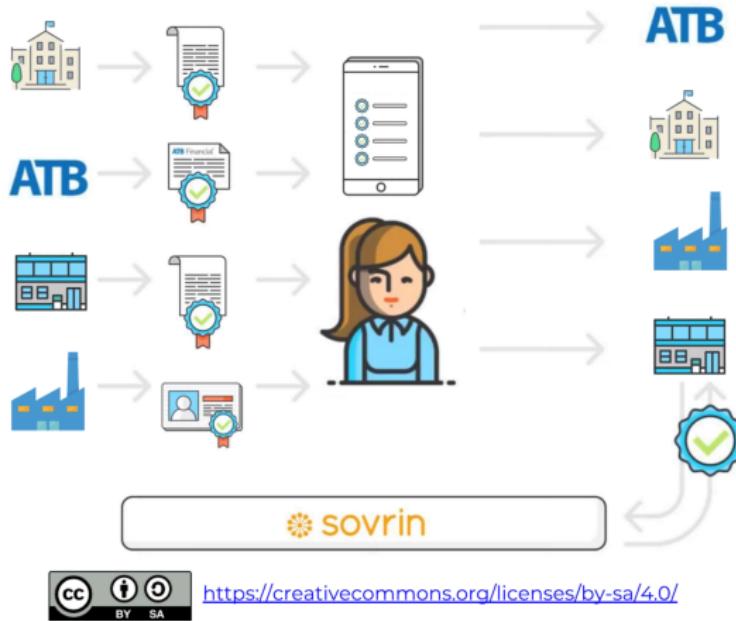


<SSIMeetup.org>

Figure: from Brown, 2019



SSI in Alberta



Alberta Credentials Ecosystem:

ATB in leading the engagement of universities, telcos, utilities, insurance, municipal gov and provincial gov

Looking to build out a robust ecosystem issuing and verifying diverse set of credentials



<https://creativecommons.org/licenses/by-sa/4.0/>



SSIMeetup.org

Figure: from Brown, 2019



A Token can represent anything

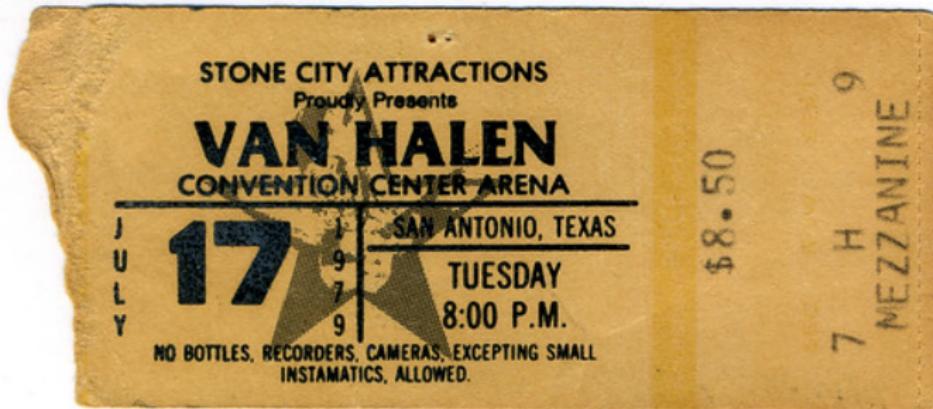


Figure: Credit : H. Michael Karshis



Native Currency



Figure: Source : give.zone (also sold on Amazon, PlayStation store, etc)



Case Study: Gold tokenization



Figure: Credit : [stevebidmead](#)

- JP Morgan tokenizes Gold (Fries, 2018)
- LAToken partners with MyGold (LATOKEN, 2017)
- ...



Case Studies: fractional real estate and track & trace (Tuna)

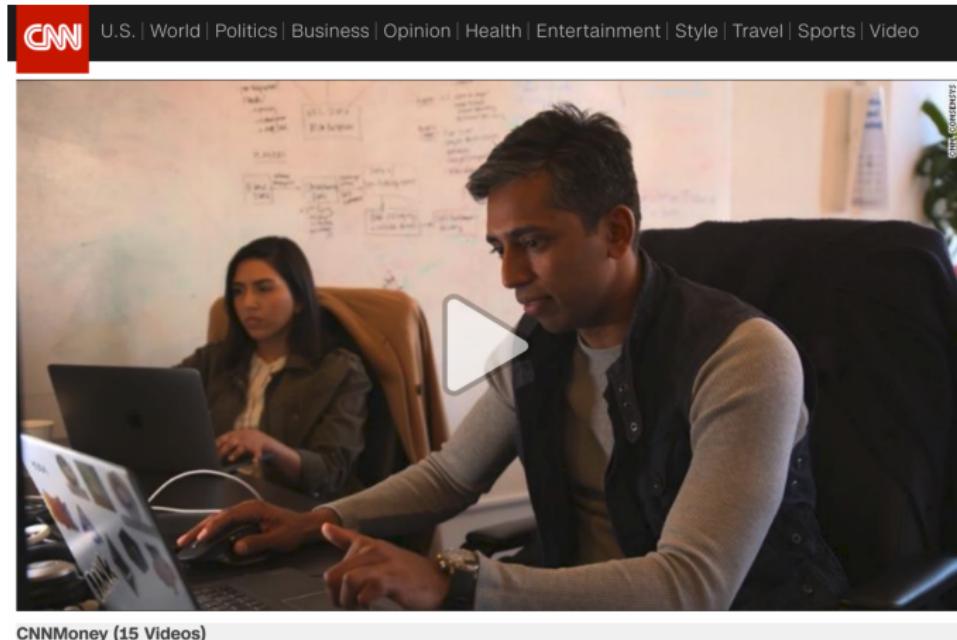


Figure: Source : CNN, 2018



Case Study: Ontario farmers sell corn on Blockchain rails

<https://farmtario.com/crops/ontario-farmers-make-first-blockchain-system-corn-sale/>

Ontario farmers make first blockchain system corn sale

An Ontario startup company facilitated the trade of high-DON corn



By John Greig

FOLLOW
Editor

Published: January 18, 2019

Crops, Markets

0 comments



11



Larry Reynolds, left, and Lloyd Crowe were the first users to make a sale of corn using Grain Discovery's system. Photo: Courtesy Grain Discovery



Alethio

Big Data and Analytics on Ethereum

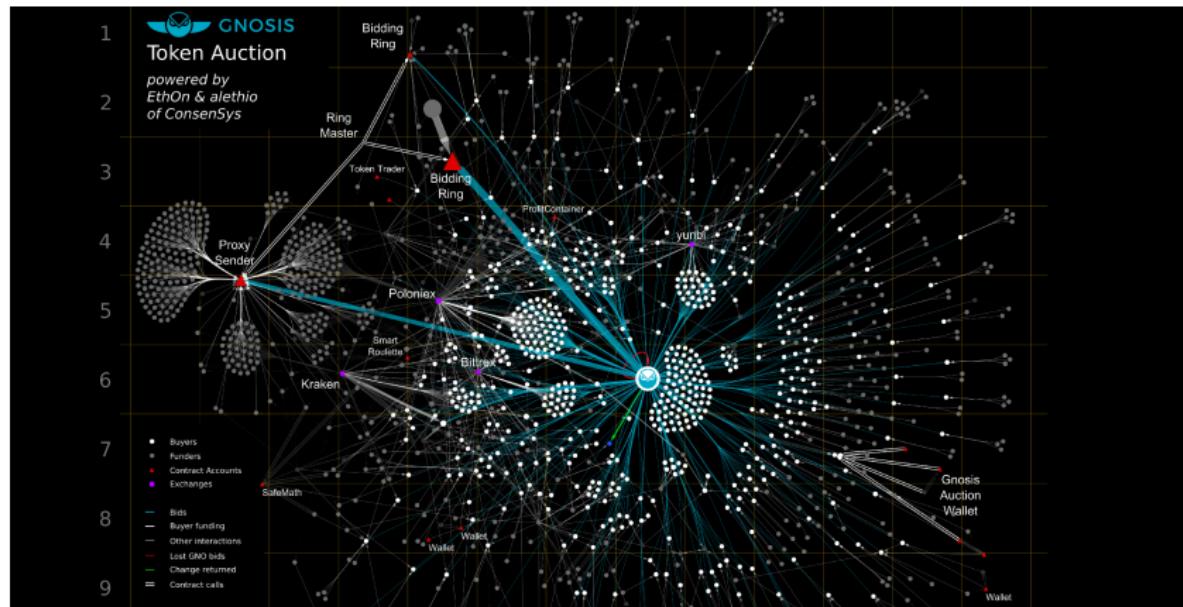


Figure: <https://aleth.io>



dfuse

Querying the blockchain (currently available for EOS and Ethereum)

Slick blockchain APIs to build
world-class applications |  |  |

With dfuse's lightning-fast streaming searches, you can concentrate on what you do best -- building stellar products that exceed your users' expectations.

email*

GET STARTED FOR FREE

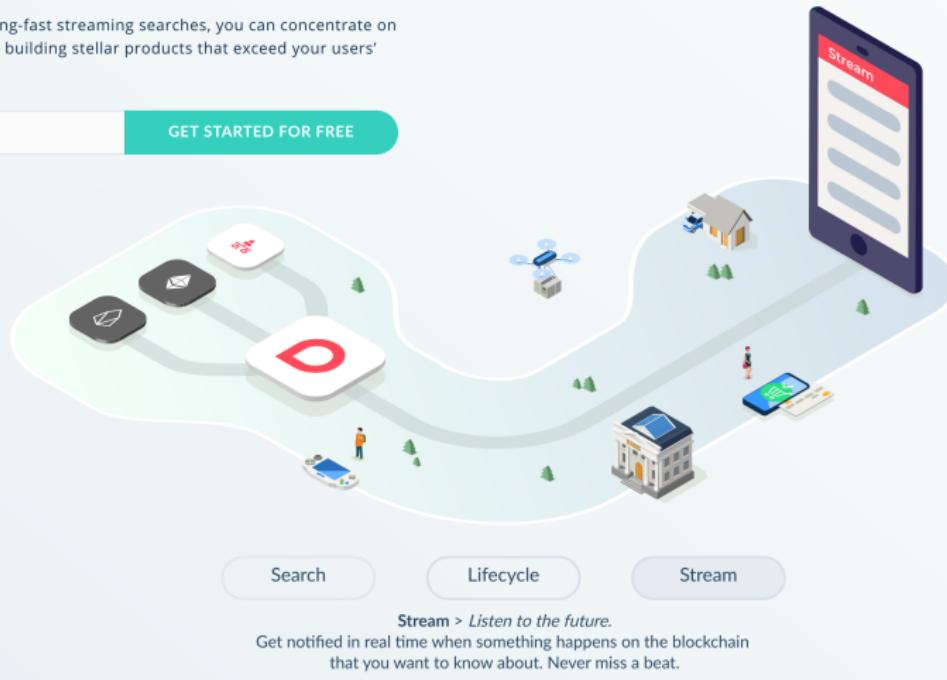


Figure: <https://dfuse.io>

Use Cases in Media & Entertainment

"In a world where the infrastructure is shared, you don't have to necessarily charge 10 to 30% for a transaction."

-Simon De La Rouviere, Ujo Music



Improve transparency of
royalty payments



Enable "per-use" payment
models with micropayments



Controlled C2C transfer of
digital or physical goods



Increase ad revenues by
bypassing intermediaries



Better visibility and efficiency
of animation pipeline



Eliminate ticket fraud in live
events & concerts



Share value in viewership and
advertising data



Simplify cross-platform
contract management



In Toronto: Prescient is developing an Attribution Ledger for Work of Arts

PROJECT INFORMATION

Attribution Ledger.

Thanks to the Internet and modern production tools, content is created and consumed at unprecedented rates. While digital service providers profit, creators have difficulty sharing and monetizing the content they produce. Unfortunately, attribution can be removed from their work and distributed online without their knowledge or rightful compensation.

At Prescient, we're solving the problem by developing an **Attribution Ledger** using Blockchain and Machine Learning. It will reliably and accurately connect a creative work with its lawful creator and rights owner. Moreover, it has the potential to include audiences in the compensation through microlicensing and peer to peer sales.



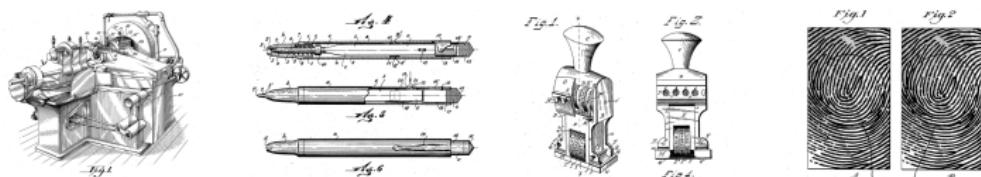
Figure: Source : <https://prescientinnovations.com/attribution-ledger>



Case study: Bernstein

Blockchain solutions for securing intellectual property assets and innovation processes

Bernstein allows companies to create a digital trail of records of their innovation processes using blockchain technology. Inventions, designs, and proofs of use can be quickly registered to obtain blockchain certificates that prove ownership, existence and integrity of any IP asset. Most importantly, all notarized information will remain perfectly private, thanks to a unique cryptographic layer.



SECURE TRADE SECRETS

Be ready to fight patent trolls and prepare a strong prior use defense.

ENHANCE CONTRACTS

Blockchain certificates for enforceable NDAs and strong licensing contracts.

ESTABLISH PRIOR ART

Enjoy indisputable timestamping and provable public availability.

MAKE COPYRIGHT CLAIMS

Easy and convenient copyright claims for software, 3D models, manuals, ..

The blockchain is the perfect registry for both public and private records.
A unique notarization platform: decentralized, uncensorable, permissionless, resilient.

Request Bernstein product deck

Figure: <https://www.bernstein.io>



Case study: Vaultitude



Figure: <https://vaultitude.com>



Case study: Baoquan



Figure: The Hangzhou Internet Court accepted evidence from the Baoquan Blockchain on a copyright case (Brunner, 2018)



Token-Curated Registry Pattern

Brief History of TCRs

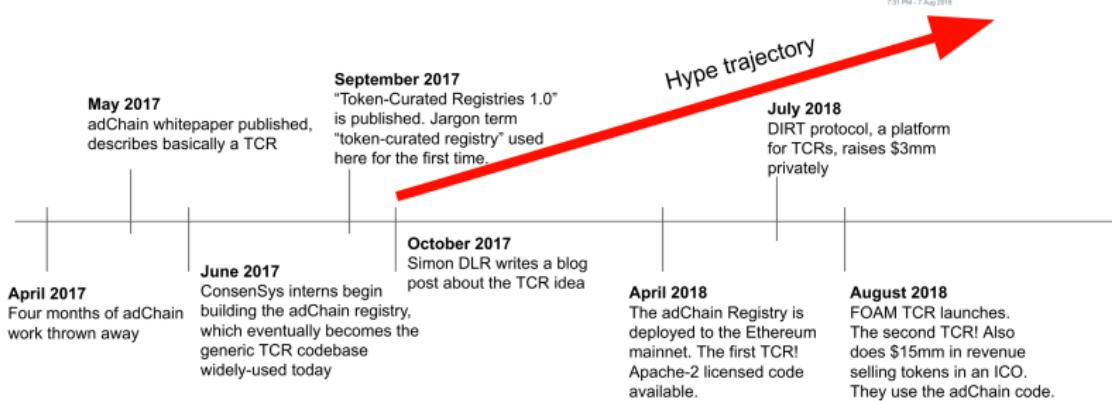


Figure: from Mike Goldin's presentation (2018)

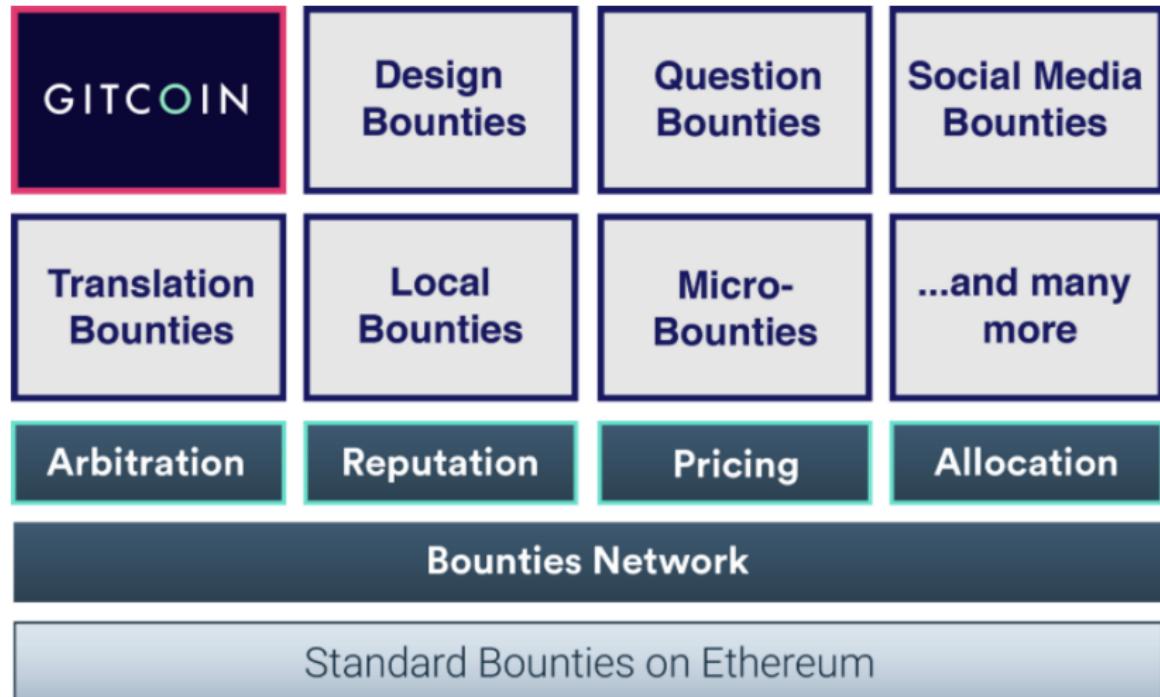
Vitalik Non-giver of Ether
@VitalikButerin

I'm worried about the "token curated registry" hype. I see a lot of mechanisms that just boil down to "token holders vote", but for well known reasons (eg. see vitalik.ca/general/2018/0...) there are deep flaws in that model. The specifics of your incentive mechanism matter!

7:31 PM - 7 Aug 2018

Developer-friendly marketplace: The Bounties Network

<https://bounties.network>



Gitcoin (depth-first) and Bounties Network (breadth-first) have integrated!



Gitcoin

Gitcoin is not a coin

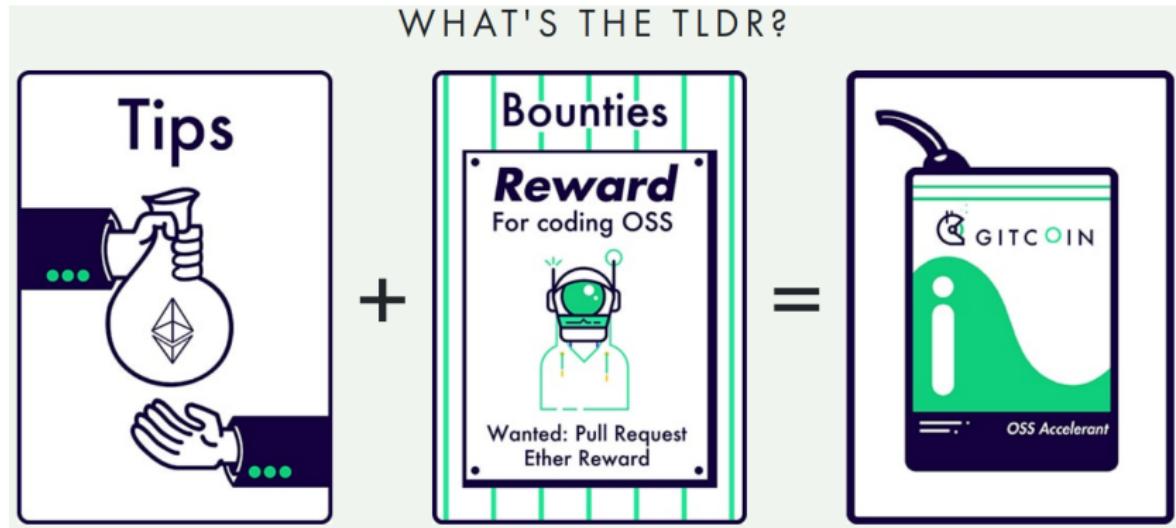


Figure: <https://gitcoin.co>



Thank you!

Email: marc@creative-emergency.com

Twitter: [@marclijour](https://twitter.com/marclijour)

www.creative-emergency.com



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