

# **Blockchain-Based LLCs**

## *What Lawyers Need to Know*

Essentials of Business Law (2021)

Ronald L. Chichester

# Overview



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# Overview

- What are Blockchains?  
(and why it matters legally)



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- What are Blockchains?  
(and why it matters legally)
- How can you make a company out of a blockchain?



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# Overview

- What are Blockchains?  
(and why it matters legally)
- How can you make a company out of a blockchain?
- How do I incorporate that?



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Read the paper!

# What is a Blockchain?

It is all about ***TRUST***



# Trust in ***CRYPTOGRAPHY***

# Trust in ***CRYPTOGRAPHY***

(Rather than people)

# Cryptographic *HASH*

## Functions and constants

The algorithm uses the functions:

$$\begin{aligned}Ch(X, Y, Z) &= (X \wedge Y) \oplus (\bar{X} \wedge Z), \\Maj(X, Y, Z) &= (X \wedge Y) \oplus (X \wedge Z) \oplus (Y \wedge Z), \\ \Sigma_0(X) &= RotR(X, 2) \oplus RotR(X, 13) \oplus RotR(X, 22), \\ \Sigma_1(X) &= RotR(X, 6) \oplus RotR(X, 11) \oplus RotR(X, 25), \\ \sigma_0(X) &= RotR(X, 7) \oplus RotR(X, 18) \oplus ShR(X, 3), \\ \sigma_1(X) &= RotR(X, 17) \oplus RotR(X, 19) \oplus ShR(X, 10),\end{aligned}$$

and the 64 binary words  $K_i$  given by the 32 first bits of the fractional parts of the cube roots of the first 64 prime numbers:

0x428a2f98	0x71374491	0xb5c0fbcf	0xe9b5dba5	0x3956c25b	0x59f111f1	0x923f82a4	0xab1c5ed5
0xd807aa98	0x12835b01	0x243185be	0x550c7dc3	0x72be5d74	0x80deb1fe	0x9bdc06a7	0xc19bf174
0xe49b69c1	0xefbe4786	0x0fc19dc6	0x240ca1cc	0x2de92c6f	0x4a7484aa	0x5cb0a9dc	0x76f988da
0x983e5152	0xa831c66d	0xb00327c8	0xbf597fc7	0xc6e00bf3	0xd5a79147	0x06ca6351	0x14292967
0x27b70a85	0x2e1b2138	0x4d2c6dfc	0x53380d13	0x650a7354	0x766a0abb	0x81c2c92e	0x92722c85
0xa2bfe8a1	0xa81a664b	0xc24b8b70	0xc76c51a3	0xd192e819	0xd6990624	0xf40e3585	0x106aa070
0x19a4c116	0x1e376c08	0x2748774c	0x34b0bcb5	0x391c0cb3	0x4ed8aa4a	0x5b9cca4f	0x682e6ff3
0x748f82ee	0x78a5636f	0x84c87814	0x8cc70208	0x90befffa	0xa4506ceb	0xbef9a3f7	0xc67178f2

```
import java.math.BigInteger;
import java.nio.charset.StandardCharsets;
import java.security.MessageDigest;
import java.security.NoSuchAlgorithmException;

// Java program to calculate SHA hash value

class GFG {
    public static byte[] getSHA(String input) throws NoSuchAlgorithmException
    {
        // Static getInstance method is called with hashing SHA
        MessageDigest md = MessageDigest.getInstance("SHA-256");

        // digest() method called
        // to calculate message digest of an input
        // and return array of byte
        return md.digest(input.getBytes(StandardCharsets.UTF_8));
    }

    public static String toHexString(byte[] hash)
    {
        // Convert byte array into signum representation
        BigInteger number = new BigInteger(1, hash);

        // Convert message digest into hex value
        StringBuilder hexString = new StringBuilder(number.toString(16));

        // Pad with leading zeros
        while (hexString.length() < 32)
        {
            hexString.insert(0, '0');
        }

        return hexString.toString();
    }
}
```

“This is an example of a hash value.”

“This is an example of a hash value.”

aa7addc7cd068cebd2c776c81d7e7e58727e8b4ce93ccac933953de15ad23105

“This is an example of a hash value.”

aa7addc7cd068cebd2c776c81d7e7e58727e8b4ce93ccac933953de15ad23105

“This is an example of a hash value. ”



“This is an example of a hash value.”

aa7addc7cd068cebd2c776c81d7e7e58727e8b4ce93ccac933953de15ad23105

“This is an example of a hash value. ”

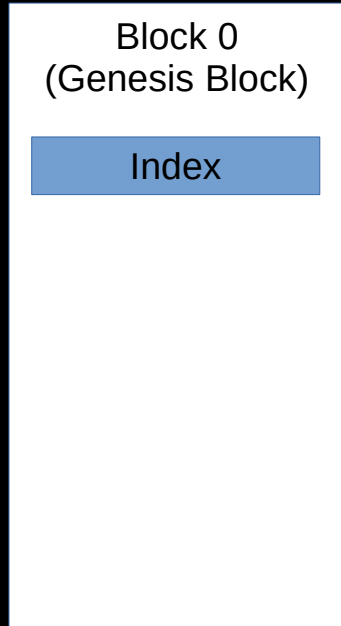
205ddd36359504b578787bcbbf61518ea217908c787f43deaf8c30235d20f840

# What is a Blockchain?

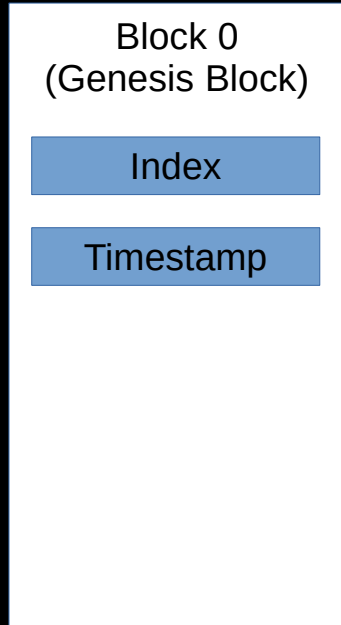
# What is a Blockchain?

Block 0  
(Genesis Block)

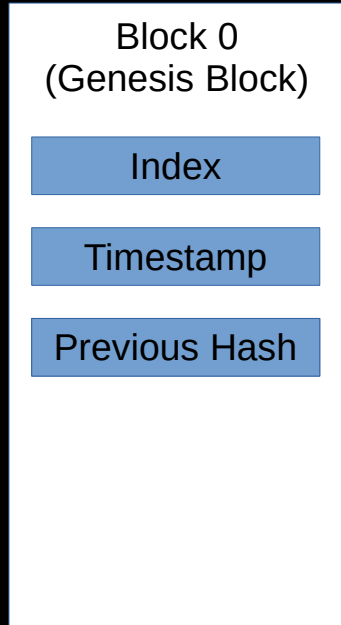
# What is a Blockchain?



# What is a Blockchain?



# What is a Blockchain?



# What is a Blockchain?

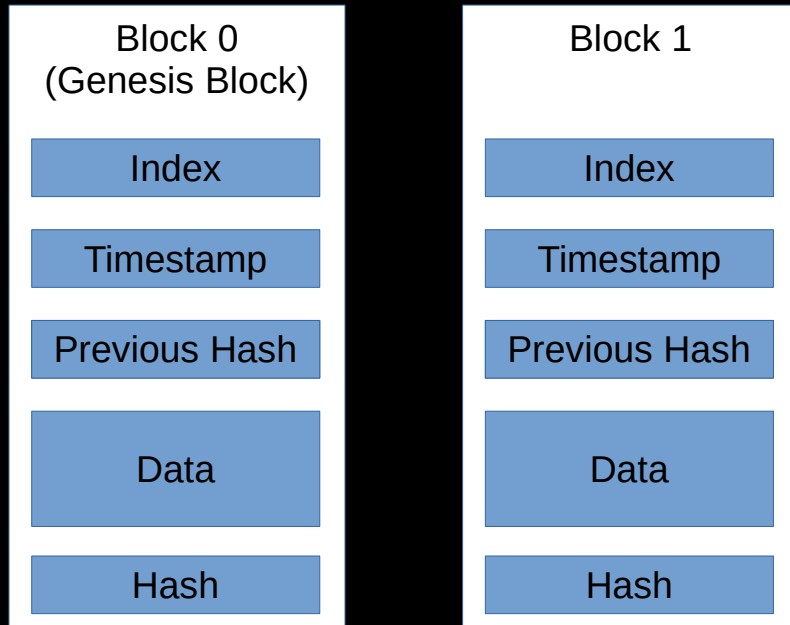


# What is a Blockchain?

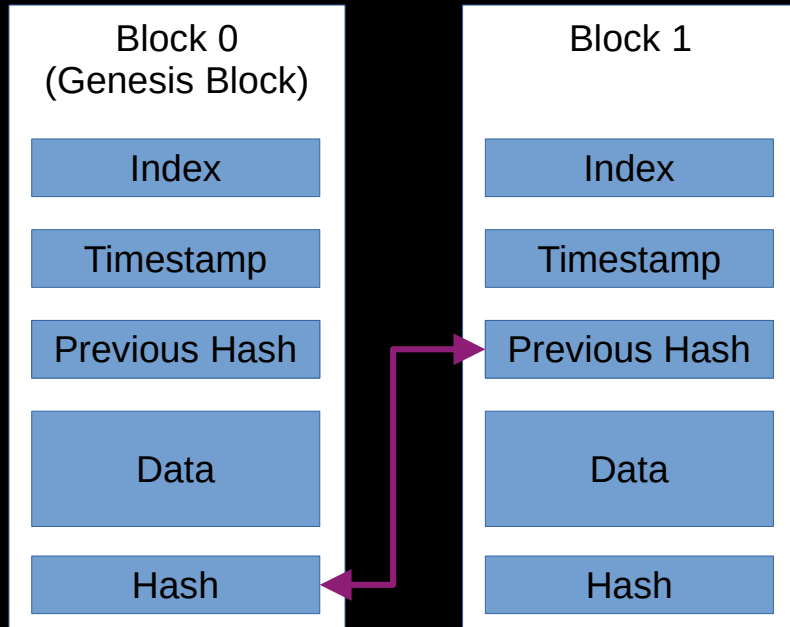




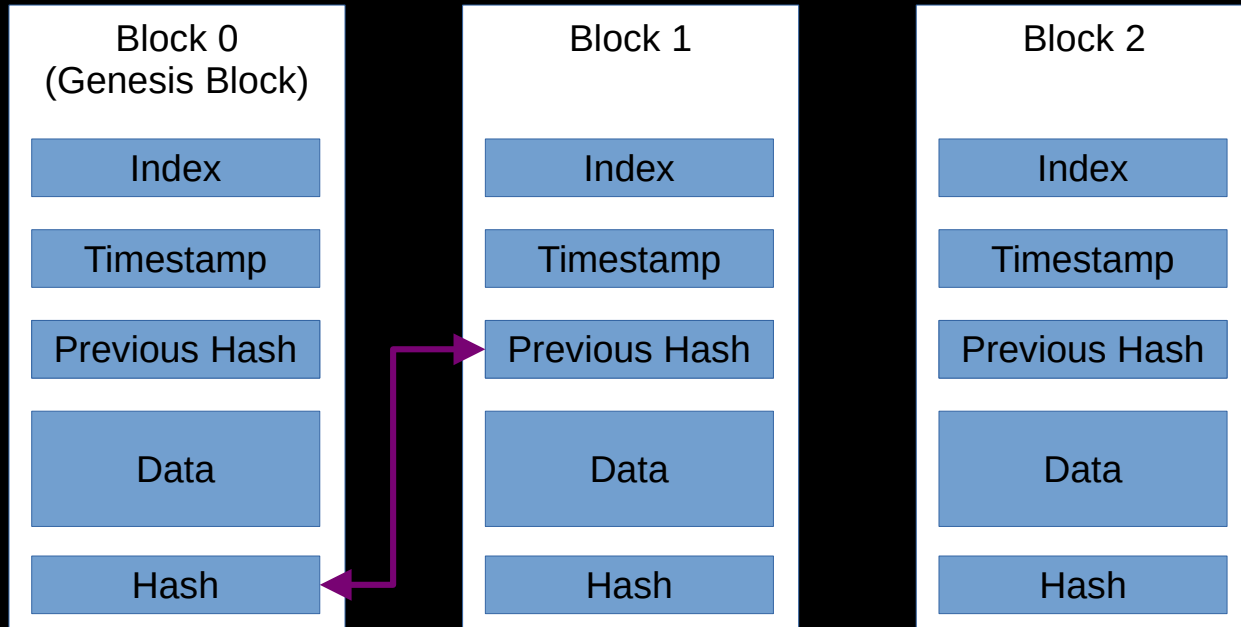
# What is a Blockchain?



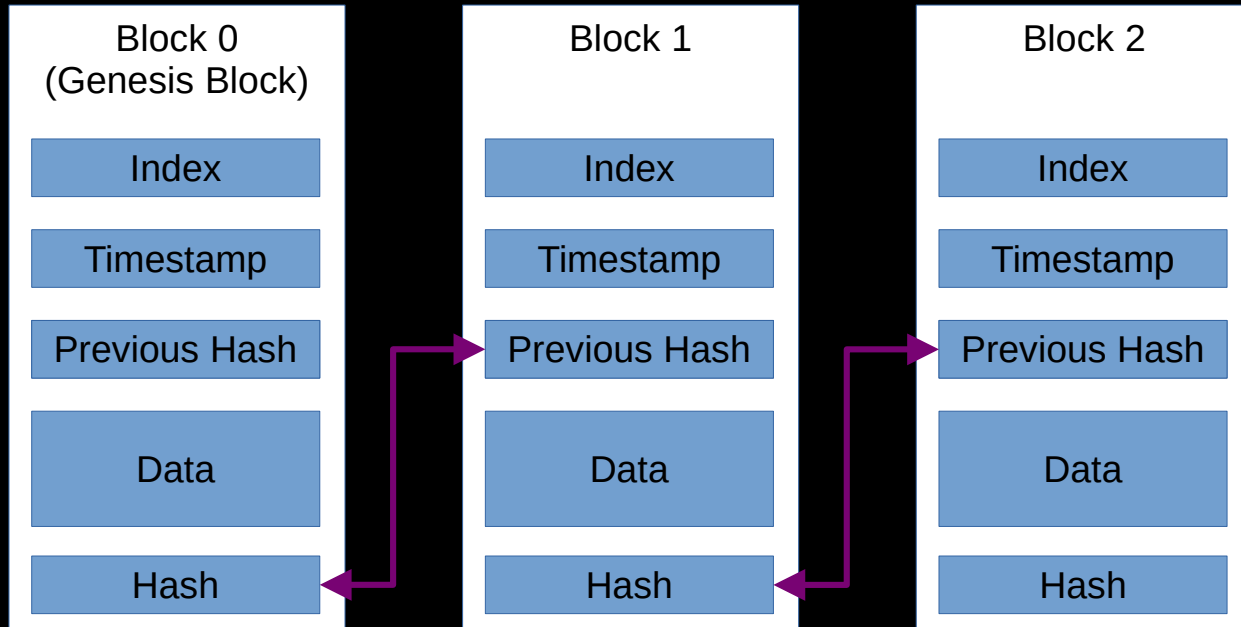
# What is a Blockchain?



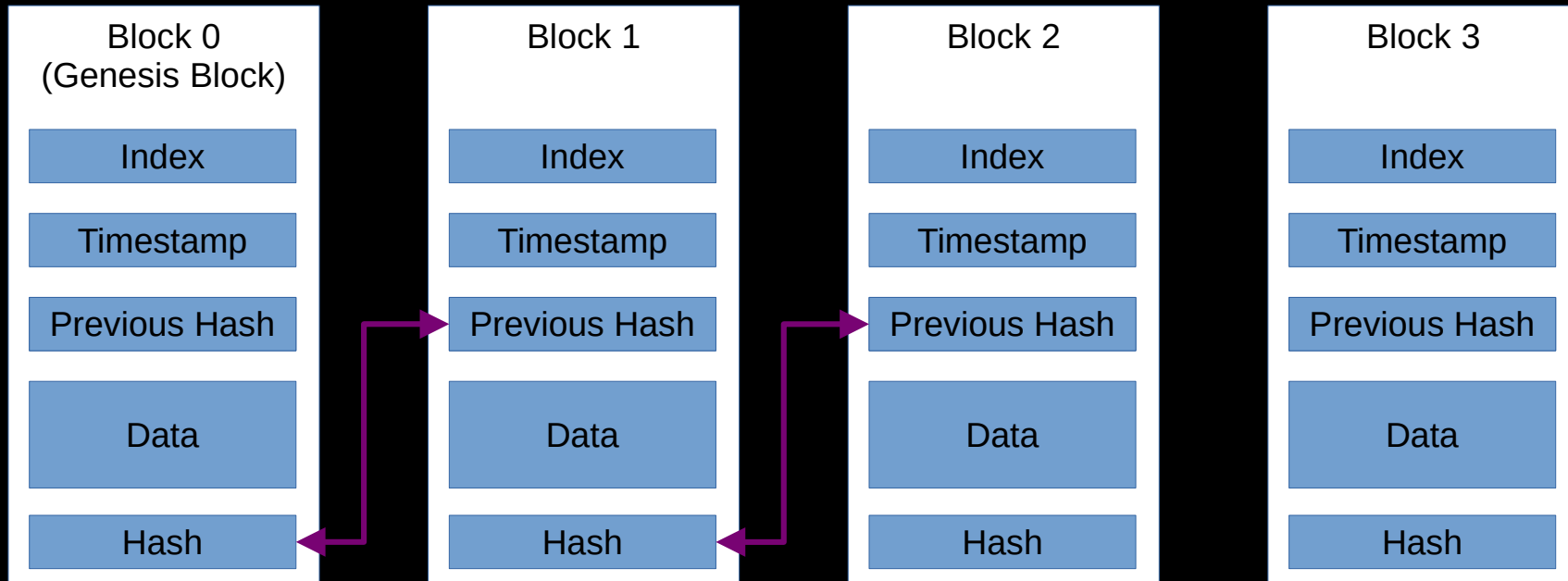
# What is a Blockchain?



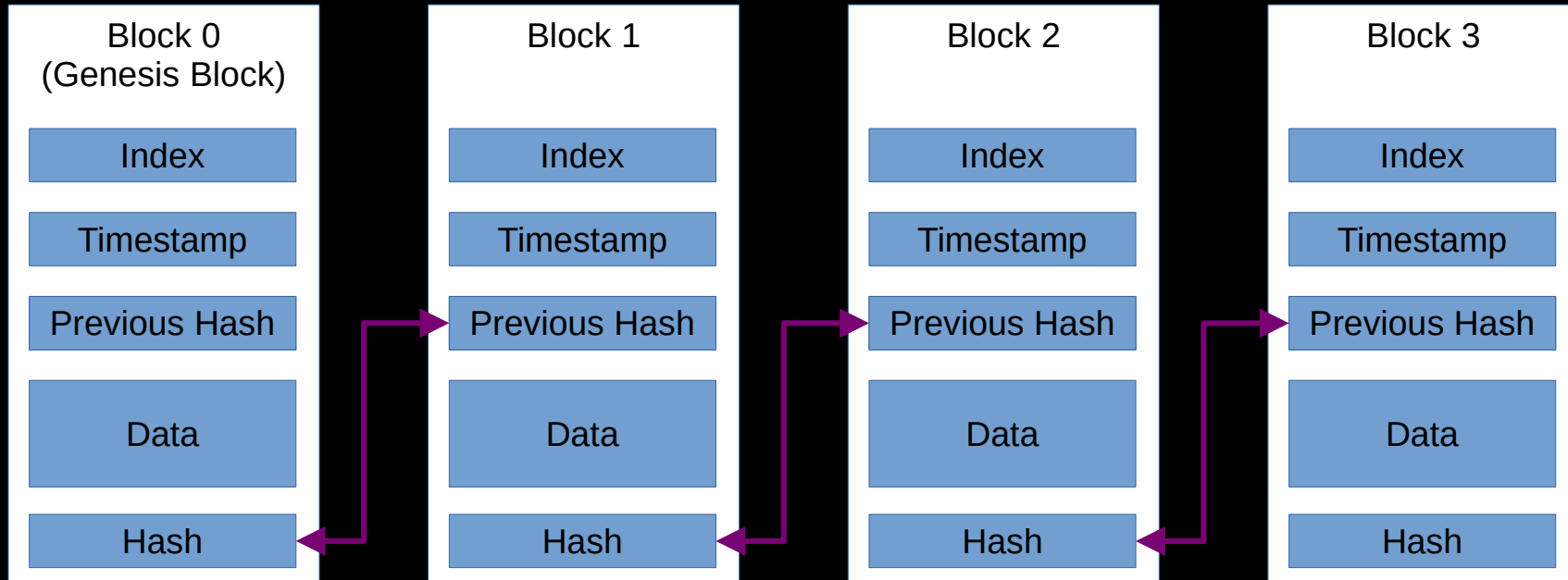
# What is a Blockchain?



# What is a Blockchain?

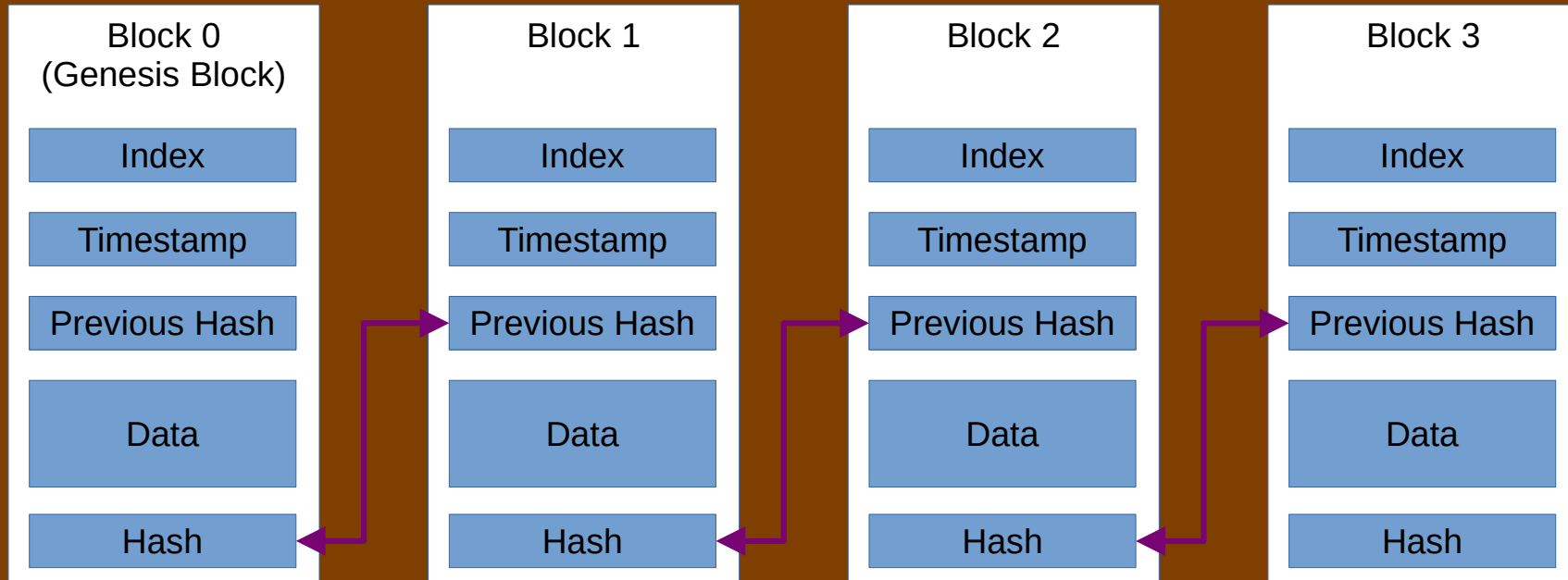


# What is a Blockchain?

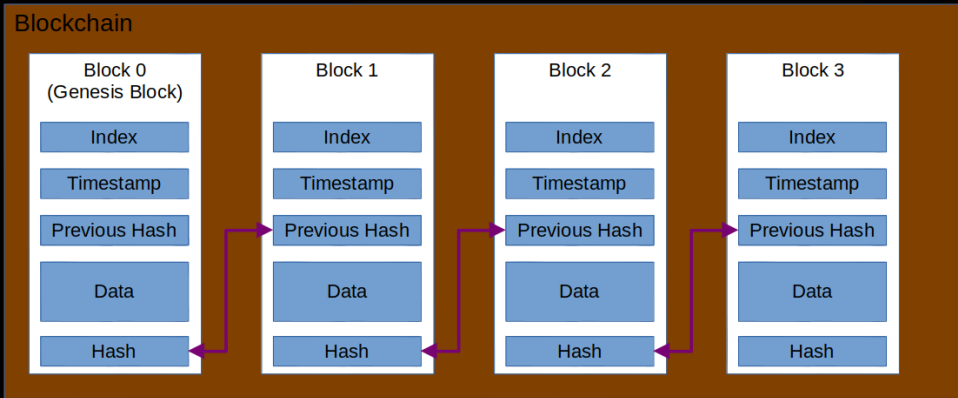


# What is a Blockchain?

## Blockchain

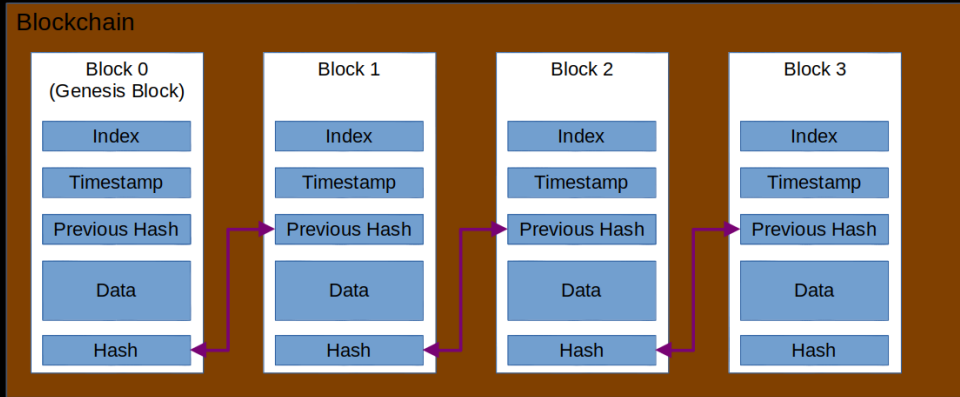


# What is a Blockchain?

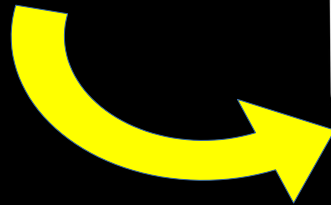




# What is a Blockchain?



**Node**



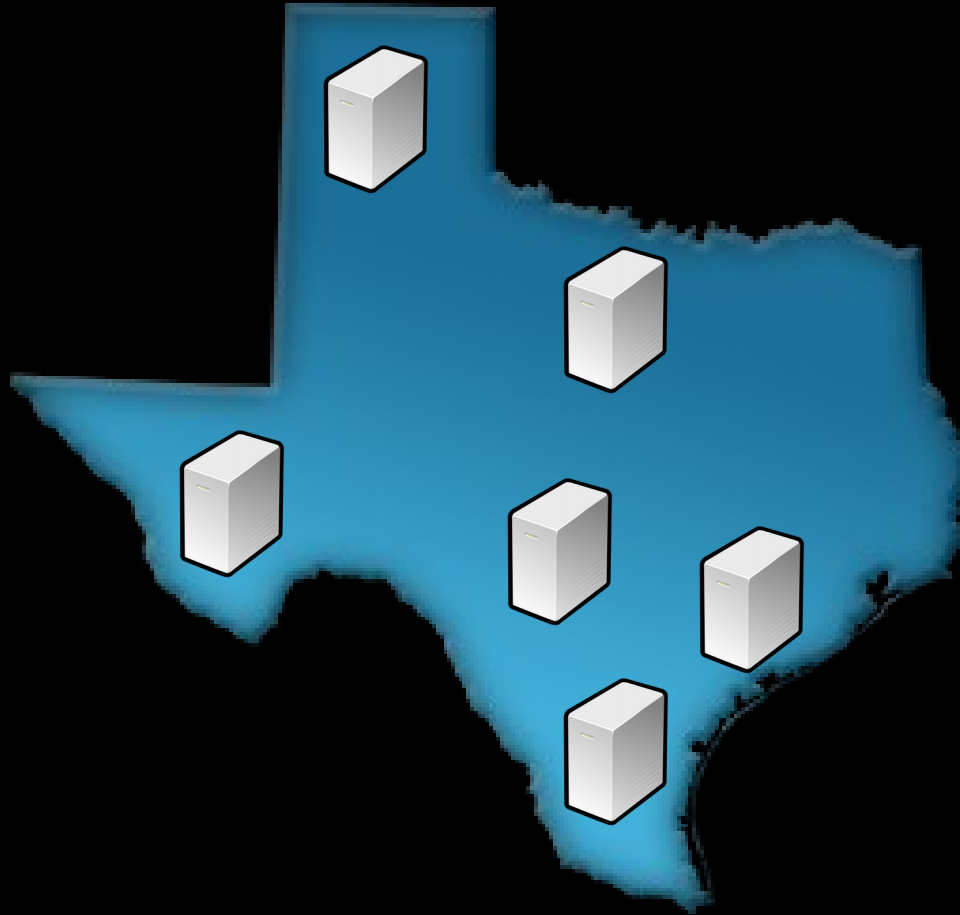
# Types of Blockchains



# Types of Blockchains



# Types of Blockchains



# Types of Blockchains



But Remember !

Not all blockchains are for  
cryptocurrencies

1994



1994



Nick Szabo

1994



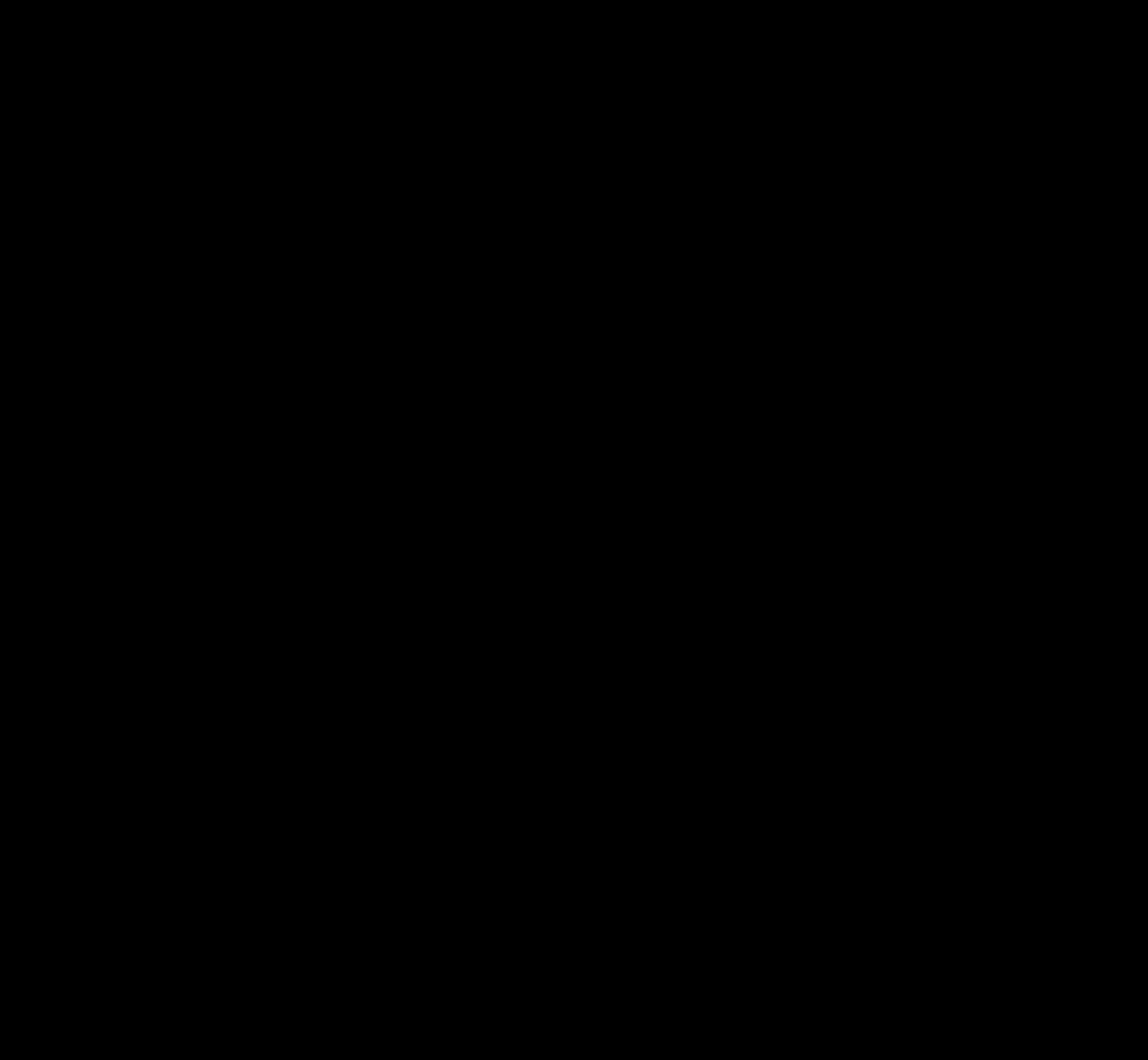
Record contracts in the form of computer code.

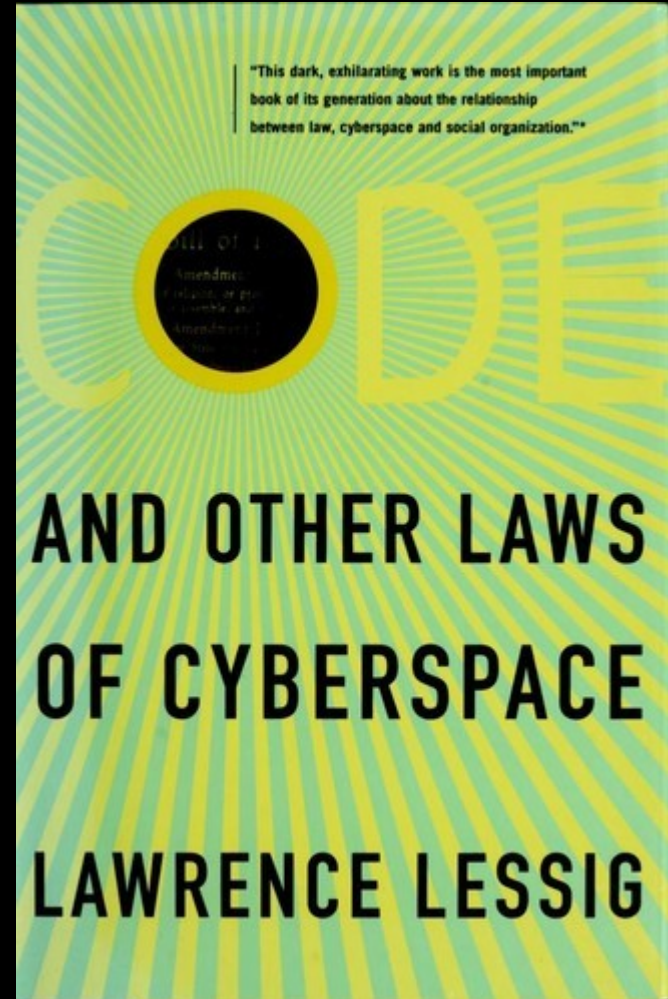
# 1994



Record contracts in the form of computer code.

No need for banks or escrow agents (or lawyers).





Contracts (or transactions) are self-executed on a trusted network that is completely controlled by computers

# Smart Contracts: Building Blocks For Digital Markets

The contract, a set of promises agreed to in a "meeting of the minds", is the traditional way to formalize a relationship. While contracts are primarily used in business relationships (the focus of this article), they can also involve personal relationships such as marriages.

[Link](#)

By: [Nick Szabo](#) · 01 Jan 1996

# Blockchains made Smart Contracts Possible



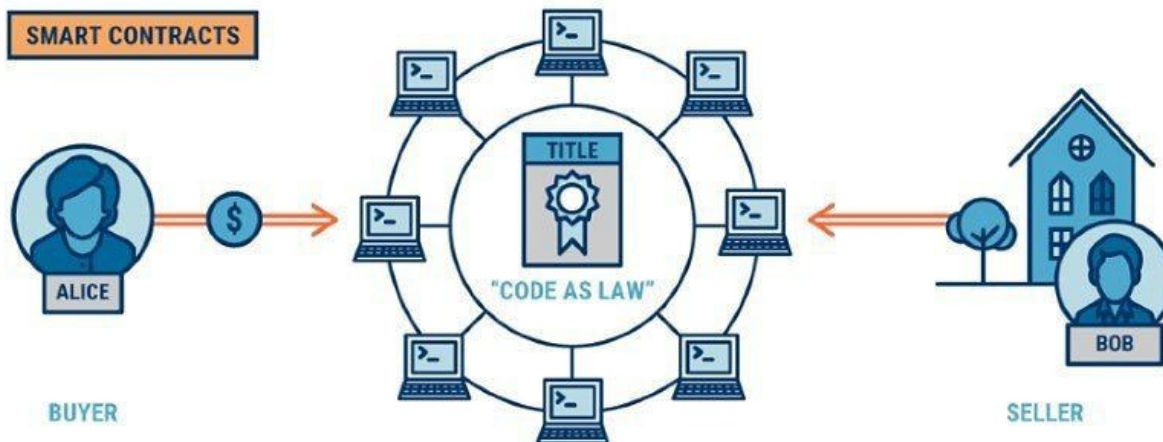


# Buying a house on Ethereum

NOW



SMART CONTRACTS



You just need a blockchain that can  
execute **software** instructions



ethereum  
classic

These blockchains can be used for  
**Smart Contracts**



These blockchains can be used for  
**Smart Contracts**



The instructions can  
implement a contract

The instructions can  
implement a contract

Contracts implemented on a  
blockchain are called  
“Smart Contracts”



# ederjohn / solidity-examples

forked from Communication-Systems-Group/solidity-examples

Watch 2
Star 2
Fork 3

- Code
- Pull requests
- Actions
- Projects
- Wiki
- Security
- Insights

master 2 branches 0 tags

Go to file Code

This branch is 27 commits ahead, 1 commit behind Communication-Systems-Group:master. Pull request Compare

Eder John Scheid Updating Contracts 63dac5a on Mar 22, 2019 37 commits

examples	Updating Contracts	2 years ago
.gitignore	added more examples	4 years ago
LICENSE	Initial commit	4 years ago
Readme.md	Some changes	3 years ago
attach-get.sh	More changes	3 years ago
deploy.sh	Updates	2 years ago
genesisBlock.json	Readme edit	3 years ago
init_geth.sh	More changes	3 years ago

Readme.md

## Solidity Smart Contract Examples

### About

No description or website provided.

- ethereum
- smart-contracts
- blockchain
- solidity
- csg
- uzh

Readme

Apache-2.0 License

### Releases

No releases published

### Packages

No packages published

### Languages



```
1  pragma solidity >0.4.10;
2
3  //the very second example
4  contract Example2 {
5
6      uint counter=0;
7      mapping (uint => string) stringList; //maps an integer to a string (creates an array)
8
9      function push(string memory info) public {
10         stringList[counter] = info; //saves the input string (info) into the list using the index "counter"
11         counter++; //increment the counter
12     }
13
14     function get(uint nr) public view returns (string memory) {
15         return stringList[nr]; //returns the string that is mapped to the index nr
16     }
17     function getCounter() public view returns (uint) {
18         return counter; //return the number of strings
19     }
20 }
```



# Examples of Smart Contracts



Tracr is connecting the Diamond Industry by  
establishing Provenance, Authenticity and  
Traceability throughout the entire value chain

[View the Tracr Overview Video](#)

# UBS Bank Is Experimenting With 'Smart-Bonds' Using The Bitcoin Blockchain



BY JEFFREY MAXIM  
JUNE 12, 2015



During his talk at IDX Derivatives Expo in London, Alex Batlin, Director in UBS's technology innovation, research and development team shed some light on what the financial institution has been working on in their innovation lab: smart-bonds on the Bitcoin blockchain.

## RECENT POSTS



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FEBRUARY 5, 2021 · 4 MINS READ



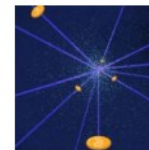
**Bitcoin: A Hedge Against The Dystopian Present**

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**Review: "Layered Money" By Nik Bhatia**

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<https://bitcoinmagazine.com/articles/ubs-bank-experimenting-smart-bonds-using-bitcoin-blockchain-1434140571>

# Tools for the Web3 Data Economy

Use **Ocean Market app** to earn by selling data and curating / staking on data. Use Ocean Protocol libraries to **build your own app** for secure, privacy-preserving data exchange.

In Ocean Protocol, each data service gets its own **datatoken**. This enables data wallets, data exchanges, and data co-ops by directly leveraging crypto wallets, exchanges, and more.

OCEAN MARKET APP





1 → Hey 🙌 ! I'm Ian the CEO ;) 🗨️ \*

"What's your name?"

Type your answer here...

---



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# Enterprise Blockchain for Modern Business Networks

DIGITALLY TRANSFORM YOUR

Business ecosystem for trusted transactions



# Industries Ripe for Smart Contracts

- Financial
- Shipping/ Supply Chain
- Insurance
- Digital Assets
- Government
- Health / Medical
- Real Estate
- Elections
- Gaming
- Legal

A collection of **Smart Contracts** is  
called a  
”**Decentralized Autonomous  
Organization**”  
(aka a “**DAO**”)



A collection of **Smart Contracts** is  
is also known as a  
”**Distributed Autonomous  
Organization**”  
(aka a “DAO”)

# Definition of a DAO

# Definition of a DAO

A DAO is a smart contract in which the governance and bylaws of a decentralized group of entities are promulgated through permanent code on a distributed ledger, and operates through distributed consensus protocols.

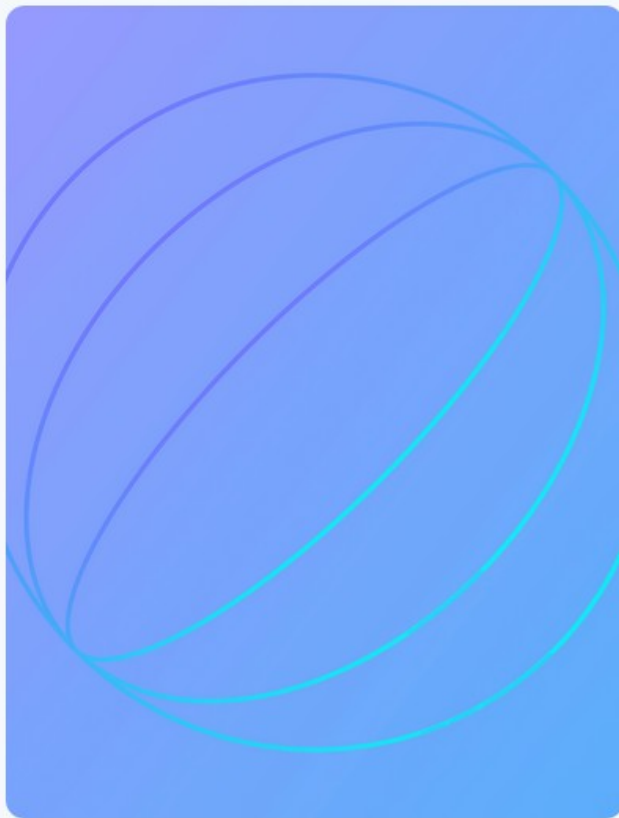
# What are DAOs good for?

DAOs are good for coordinating a global set of participants around a common mission

Global coordination

## DAOs are global

DAOs allow people to come together and work on common missions just as easy as joining a chat group.



Transparency

## DAOs are transparent

DAOs allow anyone with an internet connection to check their members, financials and decisions taken.

# DAO



Loose



Grassroots



Transparent



Open



Fully global

# Company



Tight



Hierarchical



Usually not transparent



Invite-only



Not always global

# Examples



# Next-level communities run on Aragon

Aragon gives internet communities unprecedented power to  
organize around shared values and resources.

Create a DAO →

What's a DAO?



Aragon Association and Vocdoni join forces to expand decentralized voting

Read more



## Product

DAOs

Connect

Agreements

Security

## Services

Court

## Token

ANT

## Community

Developers

Blog

Wiki

Help Desk

Experts



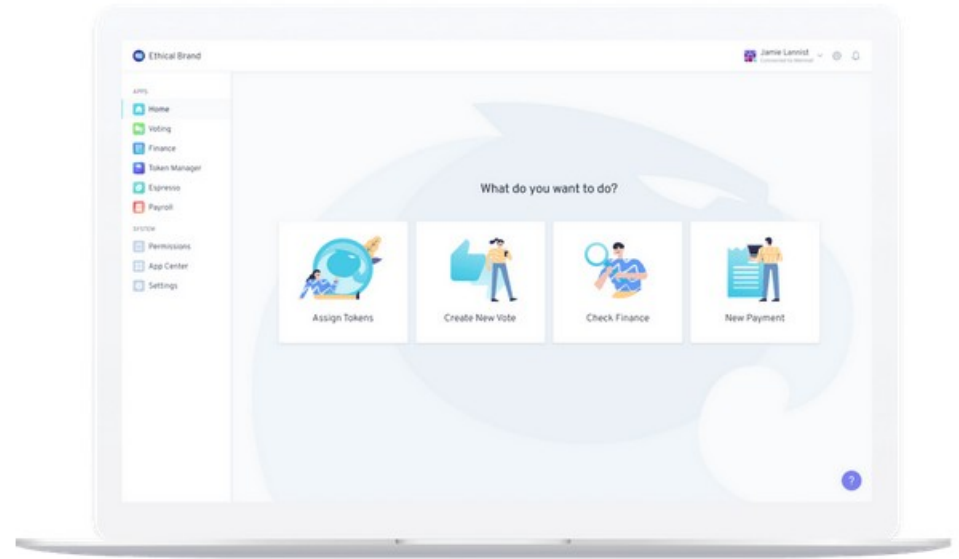


# Create a DAO

Aragon is the fastest and easiest way to set up an organization that can adapt to the challenges ahead.

Create a DAO

What's a DAO?



1,600+

Organizations created

\$650M+

USD value of assets stored

(Stats as of September 3rd)

# Communities

#PoweredByAragon



1Hive



AAVE



API3



Aavegotchi



Airalab



Aragon China



BarnBridge



Blequity



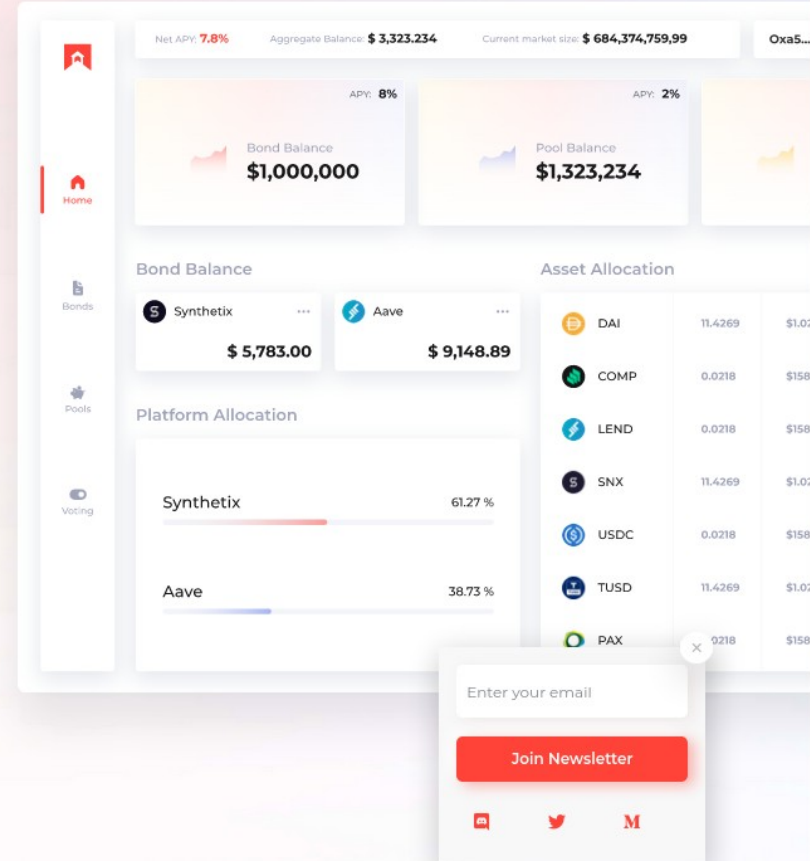
Launch App

# Tokenized Risk Protocol

A **fluctuations derivatives protocol** for hedging yield sensitivity and market price.

Launch App

Enter your email & get updates



Net APY: **7.8%** Aggregate Balance: **\$ 3,323.234** Current market size: **\$ 684,374,759.99** Oxa5...

Bond Balance **\$1,000,000** (APY: 8%) Pool Balance **\$1,323,234** (APY: 2%)

**Bond Balance**

Synthetix	\$ 5,783.00
Aave	\$ 9,148.89

**Asset Allocation**

DAI	11.4269	\$1.02
COMP	0.0218	\$158
LEND	0.0218	\$158
SNX	11.4269	\$1.02
USDC	0.0218	\$158
TUSD	11.4269	\$1.02
PAX	0.0218	\$158

**Platform Allocation**

Synthetix	61.27 %
Aave	38.73 %

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# BARNBRIDGE

Tokenized Risk Protocol | Smart Bonds on Ethereum

<https://www.BarnBridge.com> [@barn\\_bridge](#)

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Packages

People 16

Projects

## Pinned repositories

### BarnBridge-PM

BarnBridge Project Management

☆ 11 5

### BarnBridge-Whitepaper

☆ 57 13

### BBIP

BarnBridge Improvement Proposals

☆ 4 1

Type: All ▾

Language: All ▾

## barnbridge-frontend

● CSS Apache-2.0 10 10 0 1 Updated 2 hours ago



## BarnBridge-PM

BarnBridge Project Management

5 11 0 0 Updated 5 hours ago



## BarnBridge-Barn

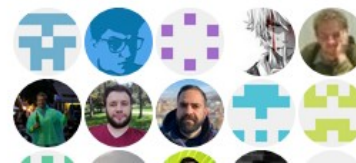


## Top languages

● JavaScript ● TypeScript ● Go  
● CSS

## People

16 >





# Building Collaborative Networks

DAOstack is an open source project advancing the technology and adoption of decentralized governance.



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DAOstack

<http://daostack.io> [hello@daostack.io](mailto:hello@daostack.io) Verified

**Repositories** 54 Packages People 4 Projects

### Pinned repositories

#### **alchemy**

An app for collaborative networks (DAOs), based on the DAO stack.

TypeScript ☆ 89 🍴 65

#### **infra**

JavaScript ☆ 21 🍴 20

#### **DAOstack-Hackers-Kit**

Everything you need to start building DAOs using the DAOstack framework

TypeScript ☆ 110 🍴 58

#### **subgraph**

A DAOstack subgraph for graph-node

TypeScript ☆ 28 🍴 25

#### **migration**

A repo for handling the migration of DAOstack contracts and DAOs.

JavaScript ☆ 13 🍴 11

#### **arc**

Arc is an operating system for DAOs.

JavaScript ☆ 16 🍴 12

🔍 Find a repository...

Type: All ▾

Language: All ▾

### subgraph

A DAOstack subgraph for graph-node

[graphql](#) [cache](#) [ethereum](#) [blockchain](#)

TypeScript GPL-3.0 🍴 25 ☆ 28 ! 21 🚀 7 Updated 2 hours ago

#### Top languages

JavaScript TypeScript HTML  
Python CSS

[Create A DAO](#)

Home

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Help Center

Get Involved

Create A DAO

Privacy Policy

Switch to v2

 DAOstack

## Other DAOs

**1UP** [Follow](#)

**14** DAO Members    **0** Open Proposals

**BuffiDAO** [Follow](#)

**0** DAO Members    **0** Open Proposals

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**DetroitDAO** [Follow](#)

**6** DAO Members    **0** Open Proposals

**dOrg** [Follow](#)

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**dxDAO** [Follow](#)

**452** DAO Members    **21** Open Proposals

**efxDAO** [Follow](#)

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**ETHGlobal** [Follow](#)

**FestDAO** [Follow](#)

**Fortmatic DAO** [Follow](#)

# DAOs have great potential



# Candidates for a DAO

DAOs have great potential

But they have some risks

# Important Questions

# Important Questions

- How *many* nodes?

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- How *many* nodes?
- **The more, the better**

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- Who *owns* the nodes?
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- The more, the better
- Public v. Private
- **Exclusivity/Transparency**

# Important Questions

- How *many* nodes?
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- **Jurisdiction**

# Important Questions

- How *many* nodes?
- Who *owns* the nodes?
- Proprietary software?
- Location of nodes?
- How to access nodes?
- The more, the better
- Public v. Private
- Exclusivity/Transparency
- Jurisdiction

# Important Questions

- How *many* nodes?
- Who *owns* the nodes?
- Proprietary software?
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- The more, the better
- Public v. Private
- Exclusivity/Transparency
- Jurisdiction
- Potential antitrust

# Important Questions

- How *many* nodes?
- Who *owns* the nodes?
- Proprietary software?
- Location of nodes?
- How to access nodes?
- Raising capital?
- The more, the better
- Public v. Private
- Exclusivity/Transparency
- Jurisdiction
- Potential antitrust
-

# Important Questions

- How *many* nodes?
- Who *owns* the nodes?
- Proprietary software?
- Location of nodes?
- How to access nodes?
- Raising capital?
- The more, the better
- Public v. Private
- Exclusivity/Transparency
- Jurisdiction
- Potential antitrust
- Securities issues

# Important Questions

## Insurance



# Important Questions

Insurance

Principal / Agency

# Important Questions

## Insurance

### Principal / Agency

(Does incorporation confer “personhood” sufficient for agency?)

UNITED STATES OF AMERICA  
Before the  
SECURITIES AND EXCHANGE COMMISSION

SECURITIES EXCHANGE ACT OF 1934  
Release No. 70694 / October 16, 2013

ADMINISTRATIVE PROCEEDING  
File No. 3-15570

In the Matter of  
  
Knight Capital Americas LLC  
  
Respondent.

**ORDER INSTITUTING ADMINISTRATIVE  
AND CEASE-AND-DESIST PROCEEDINGS,  
PURSUANT TO SECTIONS 15(b) AND 21C  
OF THE SECURITIES EXCHANGE ACT OF  
1934, MAKING FINDINGS, AND IMPOSING  
REMEDIAL SANCTIONS AND A  
CEASE-AND-DESIST ORDER**

**I.**

The Securities and Exchange Commission (the “Commission”) deems it appropriate and in the public interest that public administrative and cease-and-desist proceedings be, and hereby are, instituted pursuant to Sections 15(b) and 21C of the Securities Exchange Act of 1934 (the “Exchange Act”) against Knight Capital Americas LLC (“Knight” or “Respondent”).

# Important Questions

Algorithm

v.

Machine Learning and AI



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# Why Building an AI Decentralized Autonomous Organization (AI DAO)

Why most traditional business organizations are in danger (Business models, AI agents, etc.)



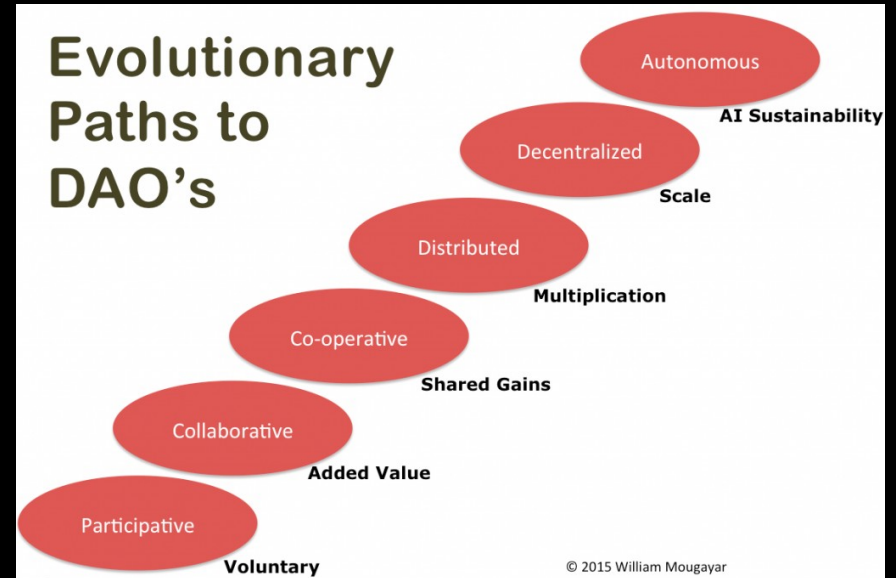
Alexandre Gonfalonieri · Jun 29, 2020 · 10 min read ★



Should you incorporate?

If so, where (and how)?

# How to incorporate a DAO

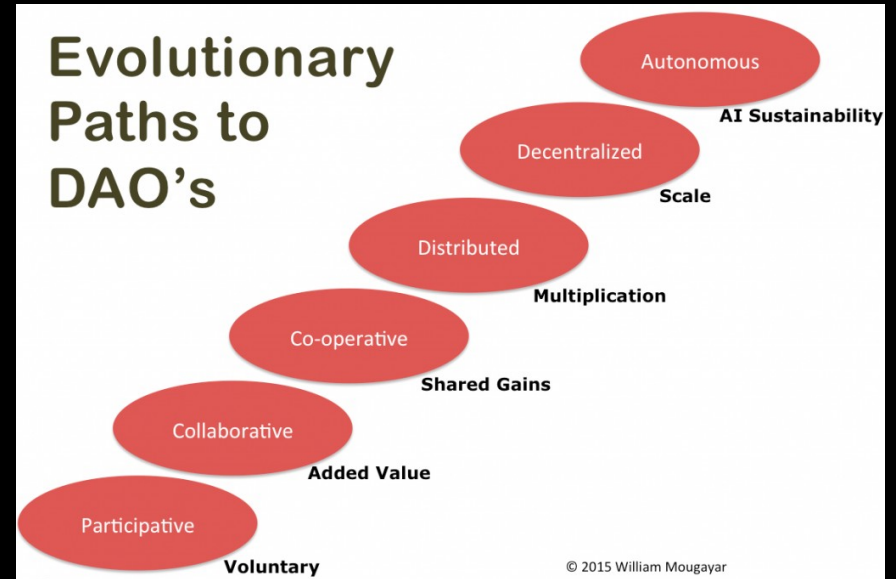


<https://www.coindesk.com/succeed-as-decentralized-autonomous-organization>



# How to incorporate a DAO

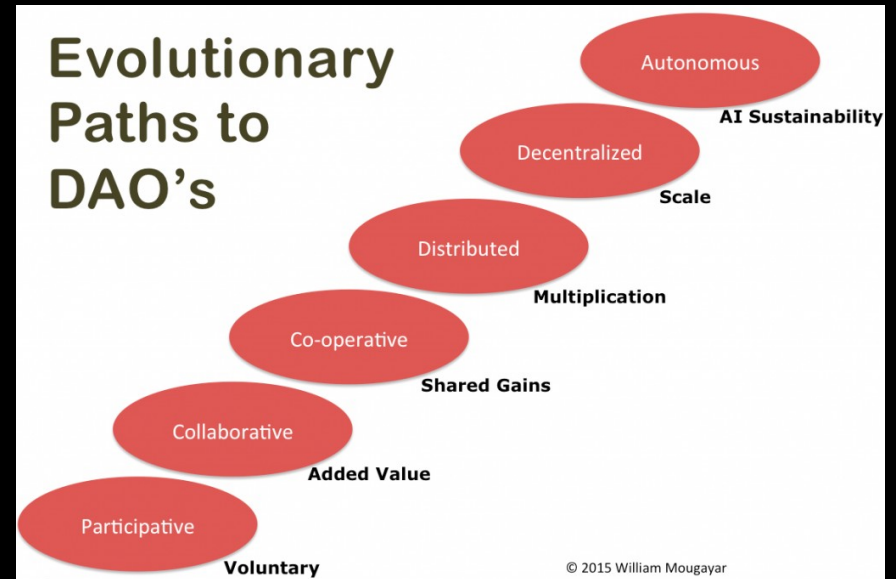
- Specialized LLC



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# How to incorporate a DAO

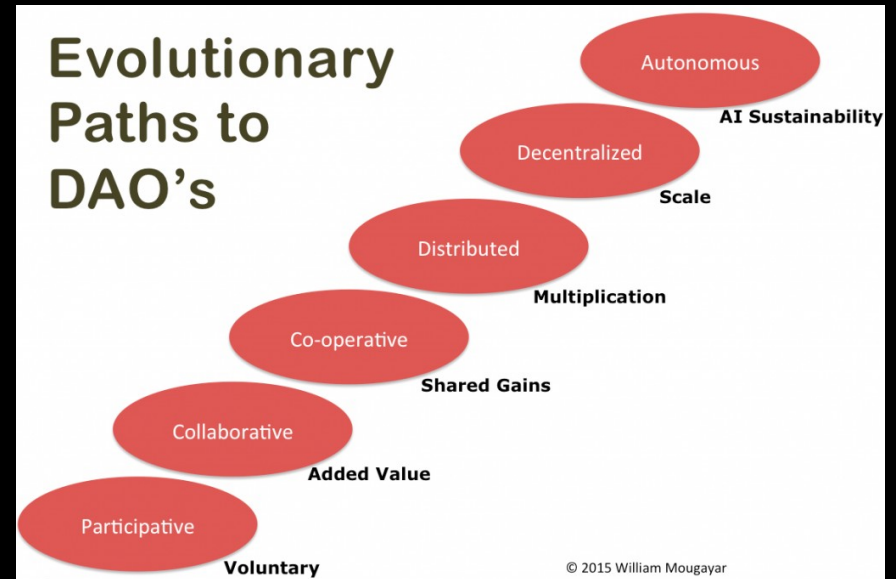
- Specialized LLC
  - Vermont BLLC



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# How to incorporate a DAO

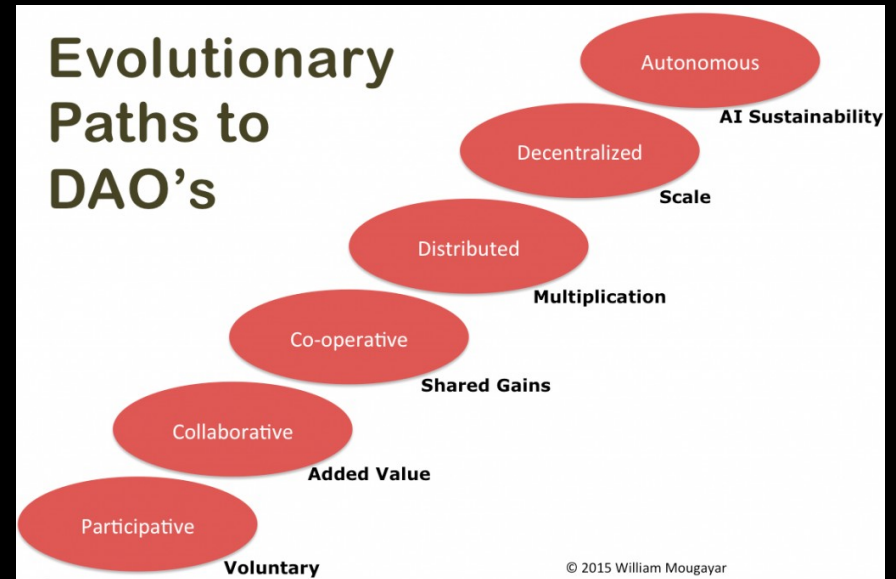
- Specialized LLC
  - Vermont BLLC
- Statutory Trust



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# How to incorporate a DAO

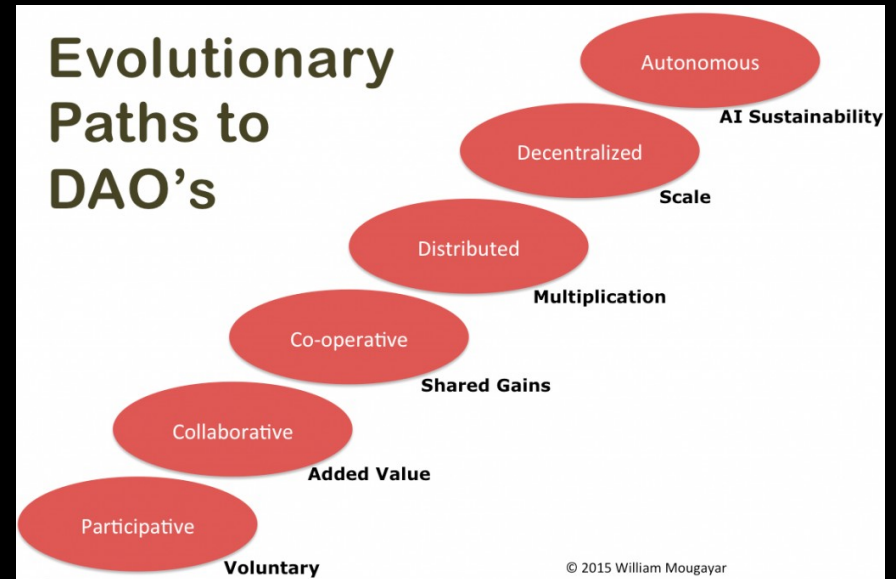
- Specialized LLC
  - Vermont BLLC
- Statutory Trust
- Benefits corporation



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# How to incorporate a DAO

- Specialized LLC
  - Vermont BLLC
- Statutory Trust
- Benefits corporation
- Regular LLC or the like



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How do you sue a DAO?

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