Blockchain: 3 Ways to Make it Pay

Aaron Pease, Esq.

Lunch & Learn
DC Bar
Road Map

• The Basics – Getting "Conversational"
• Counseling Clients in Blockchain
• Blockchain as a Practice Area
• Talking to Lawyers (and Judges) About Blockchain
• The Technology Adoption Curve
• Q & A
Audience Participation

1. Grab your phone
2. Go to www.menti.com
3. Enter the code [REDACTED] and vote!
Key Terms

- Distributed Trust
- Blocks & Hashes
- Distributed Ledger Technology (DLT)
- Smart Contracts
- Decentralized Autonomous Organization (DAO)
- Platforms
- Technology Adoption Curve
Typing "blockchain" into google will return over 75 million hits – is the hype real?
Blockchain is a solution looking for a problem

BC is not an industry, rather it's a utility or technology that gets implemented into other industries
The Heart of the "Double Spend" Problem
The Double Spend Problem

Identification of Parties

Asset Provenance

Transaction Visibility
Trust
UNIMAGINED NEW NETWORKS WILL EVOLVE TO MEET SOCIETY’S NEEDS MORE CHEAPLY AND POTENTIALLY MORE SECURELY
[Centralized]

Ledgers Are Used By All Trust Systems
Individual Trust Systems
Ledgers have one major drawback: we must trust their keepers. Administrators hold the power to doctor accounts, delete titles from land registries or add names to voting rolls.

To keep administrators from going rogue and catch them if they do, we rely on tools like audits and supervisory boards.

The list keepers (and those who watch them) form one of the biggest and least noticed industries.

The trust business
Public Trust Systems

Valid Identity Documents

[Images of various identity documents]
Fiat v. Digital Currency
We've invested heavily in trust systems . . .

but do they work?
2008 Crash
Satoshi Nakamoto is the name used by the unknown person or people who developed bitcoin, authored the bitcoin white paper, created and deployed bitcoin's original reference implementation.
Blockchain Defined:
"The blockchain is a decentralized immutable ledger of all transactions across a peer-to-peer network."

Prof. Mark Fenwick, et al.
between Anne and her brother Steve
Bitcoin Proved The Double Spend Solution

Identification of Parties

Asset Provenance

Transaction Visibility
Anatomical Features of Blockchain
Hash Functions & Cryptography

Genesis Block

<table>
<thead>
<tr>
<th>Block</th>
<th>Hash</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a0680c04c4eb53884be77b4e10677f2b</td>
</tr>
<tr>
<td></td>
<td>a0250s12c4us61245be70sgt10670hxfb</td>
</tr>
</tbody>
</table>

Transaction details and data
Hash Functions & Cryptography

Transaction Details

Type of HASH: (sha256) 256 bit crypto = 64 characters
"digital fingerprint"

SHA256 command run on Linux. The output is 256 bits or 64 characters long.

pi@raspberrypi:~ $ echo -n "I owe my sister $5" | sha256sum
5d0838314e62443e929c6794a0d2a566a23a69fa614243bfe20e8ca651e955b0

The easiest way to detect if the input has changed is to compare the message digest of 2 proclaimed versions. If they match, you can be sure that the person holding the mortgage title for example is indeed the true owner of the house.
https://blockexplorer.com

About Block Explorer

**Bitcoin Block Explorer** is an open source web tool that allows you to view information about **blocks**, **addresses**, and **transactions** on the Bitcoin blockchain. The source code is on GitHub.

**What is bitcoin?**

**Public Bitcoin API**: Machine readable stats & blockchain info can be accessed directly through the [REST](https://www.bitcoin.org/REST) and [Websockets](https://www.bitcoin.org/Websockets) APIs.

**Testnet** is Bitcoin's sandbox. Block Explorer supports viewing both the [testnet](https://www.bitcoin.org/testnet) and [mainnet](https://www.bitcoin.org/mainnet) blockchains.

Thanks to [Private Internet Access](https://www.privateinternetaccess.com) for hosting the site. They provide a [VPN Service](https://www.privateinternetaccess.com/vpn-service) that accepts Bitcoin.
Bitcoin is an application that runs on a blockchain operating system.
Walmart and 9 Food Giants Team Up on IBM Blockchain Plans

Spotify acquires blockchain startup Mediacan to solve music’s attribution problem

De Beers Group successfully tracks first diamonds from mine to retail on industry blockchain
Blockchain “operating systems”
eosio™

The most powerful infrastructure for decentralized applications
MEET ArcBlock
BORN FOR BLOCKCHAIN 3.0
The World's first blockchain ecosystem for building and deploying decentralized applications.
Self-Sovereign Identification ("SSI")

Distributed Identification ("DiD")
Credentialing Applications

The Open Initiative for Blockchain Certificates

Build apps that issue and verify blockchain-based certificates for academic credentials, professional certifications, workforce development, and civic records.

LEARN MORE    JOIN COMMUNITY
Blockchain Credentialing
In8bc Hyperledger

<table>
<thead>
<tr>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>123 Test Street</td>
</tr>
<tr>
<td>Awesomeville, FL 10101</td>
</tr>
<tr>
<td>US</td>
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</table>

<table>
<thead>
<tr>
<th>Credentials</th>
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<tr>
<td><strong>Faber College</strong></td>
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<td>Faber College</td>
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<td>2018-08-20</td>
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<tr>
<td><strong>Acme Corporation</strong></td>
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<td>2018-08-20</td>
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<tr>
<td><strong>Gov ID</strong></td>
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<td>Gov ID</td>
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<td>2018-08-19</td>
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</table>
Blockchain
7
Client Use Cases in Blockchain
TOTAL INDUSTRY FUNDING BY REGION
Compared to overall funding since 2012

$478.4B TOTAL FUNDING
$81.3B TOTAL FUNDING
$85.3B TOTAL FUNDING

0.32% $1.53B
1.25% $1.03B
0.25% $210M

NORTH AMERICA
EUROPE
ASIA

READING THE CHART
The size of each pie chart represents the total amount of funding of startups in the respective region since 2012.
The slices show how much of this total funding went to the startups in the blockchain industry.
For definitions of regions, please see definitions.

KEY TAKE-AWAY
North America has received the most funding in the industry but just 0.32% of the total funding in the region went to blockchain startups.
Europe has the largest share of funding going to the industry. 1.25% of total funding in the region goes to blockchain startups.
# TOP INVESTORS

**INVESTING IN THE BLOCKCHAIN SINCE 2012**

<table>
<thead>
<tr>
<th>Name</th>
<th>Country</th>
<th>Amount Invested</th>
<th>Number of startups invested in</th>
<th>Top 3 countries invested in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blockchain Capital</td>
<td>USA</td>
<td>$422,300,000</td>
<td>29</td>
<td>USA, Canada, Switzerland</td>
</tr>
<tr>
<td>Pantera Capital</td>
<td>USA</td>
<td>$324,400,000</td>
<td>17</td>
<td>USA, Ireland, Switzerland</td>
</tr>
<tr>
<td>Digital Currency Group</td>
<td>USA</td>
<td>$321,149,652</td>
<td>49</td>
<td>USA, Ireland, Israel</td>
</tr>
<tr>
<td>RRE Ventures</td>
<td>USA</td>
<td>$282,400,000</td>
<td>9</td>
<td>USA</td>
</tr>
<tr>
<td>Andreessen Horowitz</td>
<td>USA</td>
<td>$242,300,000</td>
<td>6</td>
<td>USA</td>
</tr>
<tr>
<td>Data Collective</td>
<td>USA</td>
<td>$173,800,000</td>
<td>3</td>
<td>USA, Canada</td>
</tr>
<tr>
<td>CME Ventures</td>
<td>USA</td>
<td>$162,000,000</td>
<td>3</td>
<td>USA</td>
</tr>
<tr>
<td>Ribbit Capital</td>
<td>USA</td>
<td>$154,409,590</td>
<td>4</td>
<td>USA, Canada</td>
</tr>
<tr>
<td>Khosla Ventures</td>
<td>USA</td>
<td>$146,500,000</td>
<td>3</td>
<td>USA, Canada</td>
</tr>
<tr>
<td>Max Levchin</td>
<td>-</td>
<td>$136,000,000</td>
<td>2</td>
<td>USA</td>
</tr>
</tbody>
</table>
Transformational impact of Blockchain technology on strategy and operating processes

- Experimenters
  - Pharma
  - Mechanical engineering and electronics

- Pioneers
  - Financial services
  - Logistics
  - Insurance
  - Healthcare
  - Public administration

- Observers
  - Tourism

- Opportunists
  - Construction

Financial impact of Blockchain technology (revenues/costs)
Blockchain use cases list by industry

**Financial**
- Trading
- Deal origination
- POs for new securities
- Equities
- Fixed income
- Derivatives trading
- Total Return Swaps (TRS)
- 2nd generation derivatives
- The race to a zero middle office
- Collateral management
- Settlements
- Payments
- Transferring of value
- Know your client (KYC)
- Anti money laundering
- Client and product reference data.
- Crowd Funding
- Peer-to-peer lending
- Compliance reporting
- Trade reporting & risk visualizations
- Betting & prediction markets

**Media**
- Digital rights mgmt
- Game monetization
- Art authentication
- Purchase & usage monitoring
- Ticket purchases
- Fan tracking
- Ad click fraud reduction
- Resell of authentic assets
- Real time auction & ad placements

**Asset Titles**
- Diamonds
- Designer brands
- Car leasing & sales
- Home Mortgages & payments
- Land title ownership
- Digital asset records

**IoT**
- Device to Device payments
- Device directories
- Operations (e.g. water flow)
- Grid monitoring
- Smart home & office management
- Cross-company & maintenance markets

**Government**
- Voting
- Vehicle registration
- WIC, Vet, SS, benefits, distribution
- Licensing & identification
- Copyrights

**Payments**
- Micropayments (apps, 402)
- B2B international remittance
- Tax filing & collection
- Rethinking wallets & banks

**Computer Science**
- Micronization of work (pay for algorithms, tweets, ad clicks, etc.)
- Expans of marketplace
- Disbursement of work
- Direct to developer payments
- API platform plays
- Notarization & certification
- P2P storage & compute sharing
- DNS

**Identity**
- Personal
- Objects
- Families of objects
- Digital assets
- Multifactor Auth
- Refugee tracking
- Education & badging
- Purchase & review tracking
- Employer & Employee reviews

**Medical**
- Records sharing
- Prescription sharing
- Compliance
- Personalized medicine
- DNA sequencing

**Supply Chain**
- Dynamic ag commodities pricing
- Real time auction for supply delivery
- Pharmaceutical tracking & purity
- Agricultural food authentication
- Shipping & logistics management

**Insurance**
- Claim filings
- MBS/Property payments
- Claims processing & admin
- Fraud prediction
- Telematics & ratings
Exemption requirements: Business league

A business league is an association of persons having some common business interest, the purpose of which is to promote such common interest and not to engage in a regular business of a kind ordinarily carried on for profit.

To be exempt as a business league, an organization's activities must be devoted to improving business conditions of one or more lines of business (as distinguished from performing particular services for individual persons). It must be shown that the conditions of a particular trade or the interests of the community will be advanced. Merely indicating the name of the organization or the object of the local statute under which it is created is not enough to demonstrate the required general purpose.

No part of a business league's net earnings may inure to the benefit of any private shareholder or individual and it may not be organized for profit to engage in an activity ordinarily carried on for profit (even if the business is operated on a cooperative basis or produces only enough income to be self-sustaining).

To be exempt, a section 501(c)(6) organization must receive meaningful membership support.

Trade associations and professional associations are business leagues. Chambers of commerce and boards of trades are of the same class as business leagues, but rather than promoting one or more lines of business, their efforts are directed to promoting the common economic interests of all commercial enterprises in a given trade community. The requirements for exemption of these organizations are substantially the same as for business leagues.
Introducing Enterprise Ethereum Alliance

The Enterprise Ethereum Alliance (EEA) is the industry's first global standards organization to deliver an open, standards-based architecture and specification to accelerate the adoption of Enterprise Ethereum. The EEA's world-class Enterprise Ethereum Client Specification and forth-coming testing and certification programs will ensure interoperability, multiple vendors of choice, and lower costs for its members - the world's largest enterprises and most innovative startups. For additional information about joining the EEA, please reach out to membership@entethalliance.org.

TRUST, PRIVACY & PERFORMANCE
Implications of Smart Contracts?
Decentralized Autonomous Organization (DAO)

The DAO is a corporation build in code not law. It has no staff and it is governed by self-executing smart contracts.

The most advanced embodiment of an “automatic company that operates without managers or boards of directors – making them the purest form of shareholder governance.”
DAOs are:

1. Pure science fiction
2. Possible, but not in my lifetime
3. Probable, within the decade
4. Old news, we've had them for years
Automated company raises equivalent of $120M in digital currency

Richard Waters
Published 2:34 AM ET Tue, 17 May 2016

FINANCIAL TIMES
Chiefless Company Rakes In More Than $100 Million

Group called DAO is running itself via computer code

By Paul Vigna
May 16, 2016

Can a company run itself without executives or managers or a board of directors? One of the more radical experiments in technology aims to find out.

A group called DAO, which stands for Decentralized Autonomous Organization, is running itself via computer code on a network. Every operating detail, from governance to day-to-day operations to payment schedules, is laid out in the code that runs the company. There are no incorporation papers, board of directors or CEO.
Crypto-investing

The DAO of accru

A new, automated investment fund has attracted stacks of digital money

It sounds like a cult, but it wants to be a venture-capital fund of sorts. As The Economist went to press, the DAO (short for decentralised autonomous organisation) had already raised the equivalent of nearly $150m to invest in startups. This, say its fans, makes it the biggest crowdfunding effort
DAOs are often offered as a step past corporations, an evolutionary structure in which human governance is replaced by code, and the organization acts without human meddling:

Well, not quite
Blockchain in Law Practice

Business & Corp  FINTECH  Litigation
How to Sue A DAO

Published on March 14, 2016

Stephen Palley
Partner at Anderson Kill focused on Construction, Insurance, Blockchain, and Compliance Driven Software Development
46 articles
DAO evangelists tout staff-less, asset-less, location-less, decentralized model, but lacking a formal human-created legalized entity, a court would likely impose one.

Lacking assets or legal form, it's likely a court would impose upon the entity (attempting not to be an entity) a constructive fiction allowing a suit to proceed against the hand(s) that made it.

"If successful, I'd be inclined to argue that the hands creating the DAO constitute a general partnership, thus availing my client of joint and severable liability."
Wait, no human hands?

A court would likely look to the designer(s) of the DAO, and keep looking, until finding the "first mover" or "human hand."

As a legal matter, I'm not convinced it's possible to extract human ownership, agency, or control from any entity. As a policy matter, it's likely not a good idea to try.

DAOs still must operate in the real world subject to contract provisions governing tangible goods and service providers.

Unincorporated DAO? Start with members. Can't find members? Refer to first mover.
Initial Coin Offerings (ICOs)
BlockStarter

BlockStarter is another blockchain platform that is expected to revolutionize the ICO industry in 2018.

The platform has recently unveiled a user-friendly interface to allow non-tech-savvy entrepreneurs to issue ICOs without much hassle.
SEC Adopts Rules to Permit Crowdfunding
Proposes Amendments to Existing Rules to Facilitate Intrastate and Regional Securities Offerings

FOR IMMEDIATE RELEASE
2015-249
Washington D.C., Oct. 30, 2015 — The Securities and Exchange Commission today adopted final rules to permit companies to offer and sell securities through crowdfunding. The Commission also voted to propose amendments to existing Securities Act rules to facilitate intrastate and regional securities offerings. The new rules and proposed amendments are designed to assist smaller companies with capital formation and provide investors with additional protections.

Crowdfunding is an evolving method of raising capital that has been used to raise funds through the Internet for a variety of projects. Title III of the JOBS Act created a federal exemption under the securities laws so that this type of funding method can be used to offer and sell securities.

“There is a great deal of enthusiasm in the marketplace for crowdfunding, and I believe these rules and proposed amendments provide smaller companies with innovative ways to raise capital and give investors the protections they need,” said SEC Chair Mary Jo White. “With these rules, the Commission has completed all of the major rulemaking mandated under the JOBS Act.”

The final rules, Regulation Crowdfunding, permit individuals to invest in securities-based crowdfunding transactions subject to certain investment limits. The rules also limit the amount of money an issuer can raise using the crowdfunding exemption, impose disclosure requirements on issuers for certain information about their business and securities offering, and create a regulatory framework for the broker-dealers and funding portals that facilitate the crowdfunding transactions.

The new crowdfunding rules and forms will be effective 180 days after they are published in the Federal Register. The forms enabling funding portals to register with the Commission will be effective Jan. 29, 2016.
SECURITIES AND EXCHANGE COMMISSION

17 CFR Parts 200, 227, 232, 239, 240, 249, 269, and 274

[Release Nos. 33-9974; 34-76324; File No. S7-09-13]

RIN 3235-AL37

Crowdfunding

AGENCY: Securities and Exchange Commission.

ACTION: Final rule.

SUMMARY: The Securities and Exchange Commission is adopting new Regulation Crowdfunding under the Securities Act of 1933 and the Securities Exchange Act of 1934 to implement the requirements of Title III of the Jumpstart Our Business Startups Act. Regulation Crowdfunding prescribes rules governing the offer and sale of securities under new
The SEC on ICOs (Summarized)

If a token looks like a security and acts like a security, it is likely a security and governed by existing securities law.

If a token is a security and the issuer does not want to subscribe to those laws, the issuer should exclude the sale and resale of the token in US markets and to US investors.

If a token is clearly not a security (e.g. a digital currency) the issuer could access US markets and buyers.

If a token falls into a gray area, the issuer should consult US counsel to determine the likelihood of the SEC deeming it a security.
Blockchain is changing the way business is managed, identity is validated, and transactions are executed.

BC is not an industry, rather it’s a utility or technology that gets implemented into other industries.

Practice
- Smart k's – define rules and penalties and automatically enforce
- Help clients understand how to make use of BC

Scope of regulatory authority is not yet clear.
Collaborative storage of documents

Automated Payments & Billing

Automated Signatures & Registrations

Law firms, tech companies partner to build new blockchain-based platform for smart contracts

BY JASON TASHEA
POSTED JULY 30, 2018, 8:05 AM CDT

A group of law firms and tech companies have teamed up to develop the Agreements Network, a platform that will aid in the creation, use and sale of smart contracts for lawyers.

In a press release issued Thursday, law firms BakerHostetler, LegalBono and ErdosIP, and technology companies Clause, Crowdcube, LexPredict, Libra, Matterereum, Monax, Rymedi, TransparentNode and Wolfram Blockchain Labs announced the launch of the network.

With little to no code required, the platform will assist in the creation of automated payments and billing, signatures and registrations. It also allows for collaborative storage of documents and assets, as opposed to a contract being on a single firm's network.

*If launched safely and properly, the Agreements Network could provide a foundational piece of technology for a range of
The Agreements Network

An open ecosystem to create, distribute, and operate legal agreements.

*It’s the legal layer for a networked world.*

WATCH THE VIDEO

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**For Lawyers**

The Agreements Network is the foundation for open legal processes that will drive exponential growth in global networks.

WATCH THE VIDEO

---

**For Businesses**

The Agreements Network is a powerful platform for business, reducing errors, optimizing processes, and helping control risk.

WATCH THE VIDEO

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**For Developers**

The Agreements Network is a blockchain-based contract management platform featuring powerful smart contracts.

READ THE DOCS
"Productization" of legal services

By harnessing blockchain technology and smart contracts, the Agreements Network transforms static contract forms into living Active Agreements. Products in the Agreements Network will enable a quantum leap in how law is practiced and consumed, opening markets that existing legal services cannot reach.

The Agreements Network enables lawyers to meet the growing demand for legal products at network scale while increasing both revenue and value to their clients. The Agreements Network provides a base blockchain layer that gives data assurance: a reliable record of things like contract formation, chain of custody, and fulfillment events. Smart contract tools and services connected to the Agreements Network drive automation of processes like signatures, payments, registrations, and more, with little or no code required for use.

The Agreements Network
https://agreements.network
What Does the Future Hold...for lawyers?
Annual Meeting and Blockchain Event
August 19 – Gaylord National Resort, Washington, D.C.

Event Overview
#GLBC2018

The Global Legal Blockchain Consortium (GLBC) was announced on August 15, 2017 during the week of the International Legal Technology Association annual convention.

Now approaching its one-year anniversary, the GLBC is the largest blockchain consortium in the world focused exclusively on the application of blockchain technology to the business and practice of law.

The first annual meeting of the Global Legal Blockchain Consortium is expected to be the largest gathering of its kind in history. It will bring together hundreds of senior leaders of law firms, companies, technology companies, and universities to experience and discuss the application of blockchain technology to the business and practice of law.

The event will have a strong emphasis on practical applications of blockchain technology in the legal industry, with technology demonstrations, presentations, and announcements.
[Blockchain] Counselor at Law

Trust  Application  Automation

*Client-Centered Value Proposition*

Guiding the court in litigation practice

Crowd Funding Legislation
Locating the "first mover" or "hand"
What is technology adoption life cycle and chasm?
Innovator or Laggard?

"There's no chance that the iPhone is going to get any significant market share."

Steve Ballmer, Microsoft CEO, 2007

"There is no reason for any individual to have a computer in his home."

Ken Olsen, CEO Digital Equipment Corp, 1977

"The coming of the wireless era will make war impossible."

Marconi, radio pioneer, 1912

"The telephone has too many shortcomings to be seriously considered as a means of communication."

William Orton, President, Western Union, 1876

"Democracy will be dead by 1950."

John Langdon-Davies, A short History of the Future, 1936

"The horse is here to stay but the automobile is only a novelty—a fad."

The president of the Michigan Saving Bank advising Henry Ford's lawyer not to invest in Ford Motor Co., 1903

"Remote shopping, while entirely feasible, will flop."

Time Magazine, 1966

"Fooling around with alternating current (AC) is just a waste of time. Nobody will use it, ever."

Thomas Edison, 1889

"Television won't be able to hold on to any market share it captures after six months."

Darryl Zanuck, 20th Century Fox, 1946

"A rocket will never be able to leave the Earth's atmosphere."

The New York Times, 1936

"Bitcoin is a fraud."

Jamie Dimon, CEO JP Morgan, 2017