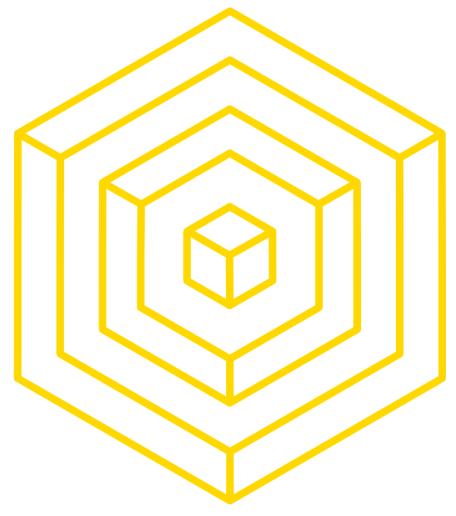


ENTERPRISE BLOCKCHAIN: REAL-WORLD APPLICATIONS

Brian Ho
Gillian Chu

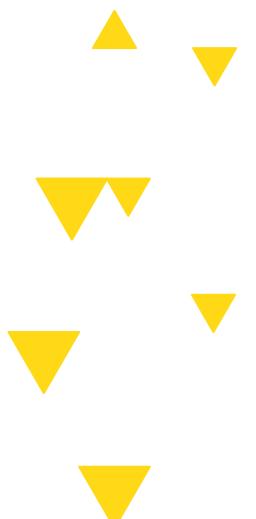


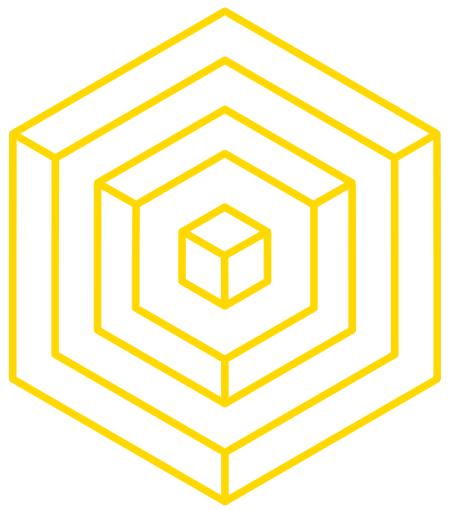
BLOCKCHAIN
AT BERKELEY



LECTURE OVERVIEW

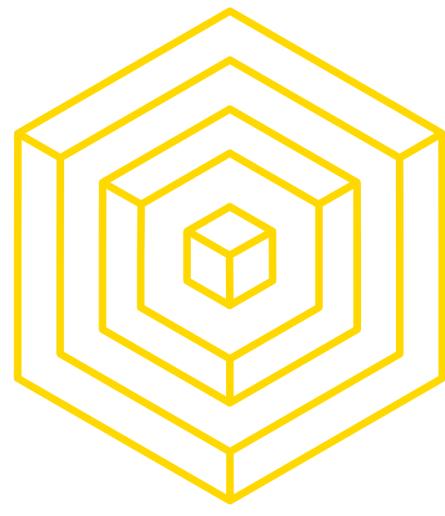
- 1 ► MOTIVATIONS & PERSPECTIVES
- 2 ► USE CASES & INDUSTRIES
- 3 ► BIG NAMES
- 4 ► ICO SCHEMAS/CULTURE
- 5 ► LAWS & REGULATIONS





MOTIVATIONS & PERSPECTIVES

BLOCKCHAIN FUNDAMENTALS LECTURE 10



PERSPECTIVES

HOW DO YOU FEEL ABOUT BLOCKCHAIN?

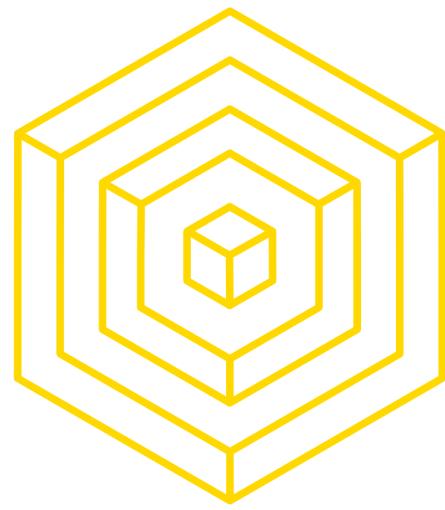
Depending on the audience that you're speaking to, there are many differing perspectives on this technology (enterprise blockchain):

- Bitcoin Maximalism
- Enterprise Blockchain sucks
- Cryptocurrencies are amazing
- Cryptocurrencies suck and blockchains are amazing
- Blockchains can be cool, but only in very particular ways (limited uses)



AUTHOR: GILLIAN CHU

BLOCKCHAIN FUNDAMENTALS LECTURE 10



MISCONCEPTIONS

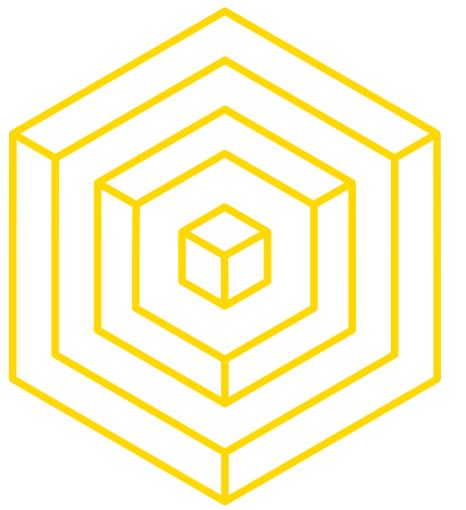
NOT ALWAYS WHAT YOU'D EXPECT

- Enterprise blockchains are always useful.
 - Some use cases have fundamental flaws, some don't even need to use a blockchain
- Blockchains are more efficient
 - Tradeoff between decentralization v.s. scalability
- Blockchains are cheap
 - Blockchains are costly to maintain and develop (mainly a community effort)
- Just build your own blockchain (rather than use existing infrastructure)
 - Not as simple as one might expect
 - Existing frameworks have proven success and security



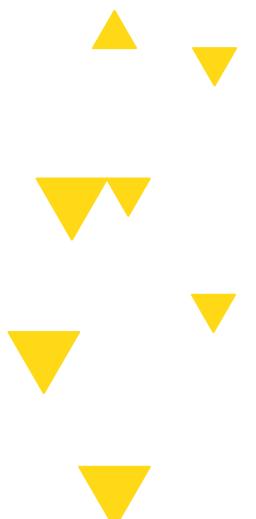
AUTHOR: GILLIAN CHU

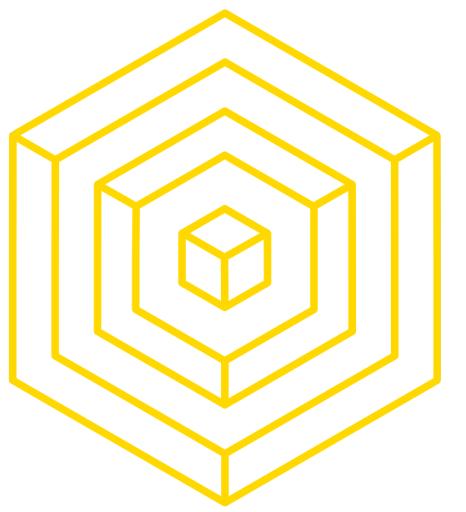
BLOCKCHAIN FUNDAMENTALS LECTURE 10



2

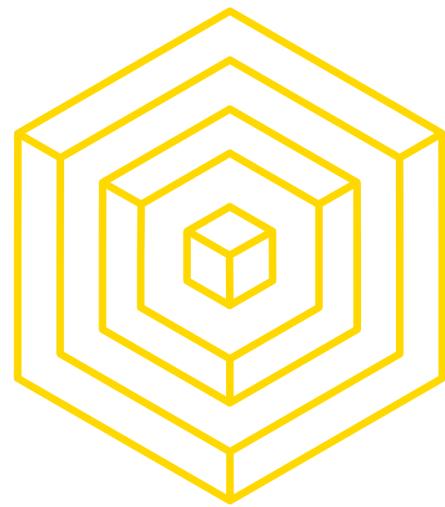
USE CASES & INDUSTRIES





2.1

AUTO & MOBILITY

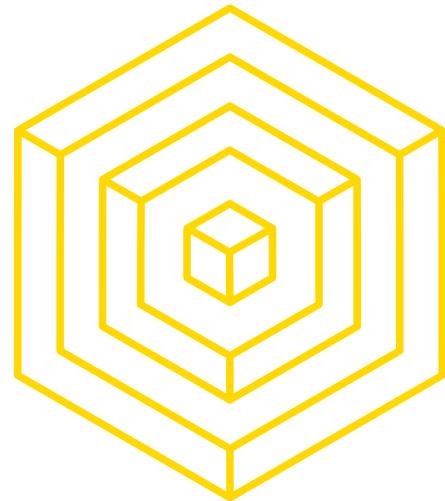


DAIMLER

- Joined IBM/Linux Hyperledger (Feb. 2017)
- In-house innovation teams exploring multiple blockchain & IoT use cases
- Issued €100M euro 1-year corporate bond (Jun. 2017)
 - Funding for blockchain R&D
 - Performed entire bond trx over private blockchain network:
 - Origination -> allocation -> distribution -> execution -> confirmation of interest payments & principal repayment
- Acquired European payment startup PayCash (supports bitcoin payments) as part of exploration of in-car payments)
- Interests include data integrity in-house, data sharing with other auto companies



DAIMLER

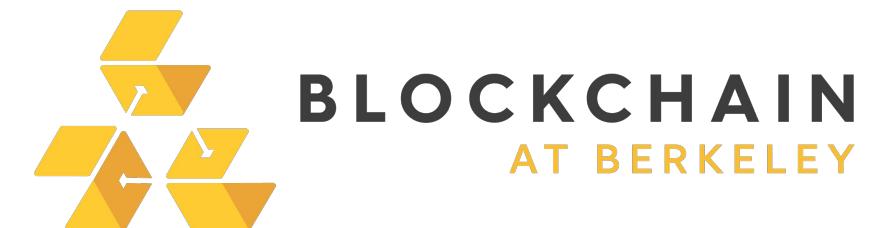


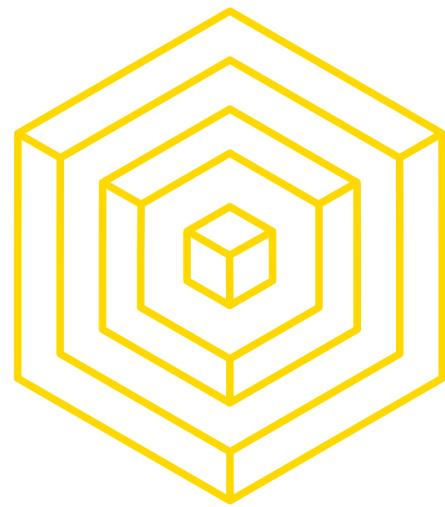
VEHICLE DATA SHARING & EXCHANGE

- Incentivize sharing of data (ex. AV driving data) by paying vehicle owners using token
 - Open up data silos for data research: autonomous driving becomes faster and safer for everyone
 - Incentivize drivers to share data by paying them a token
 - Coalition of auto companies could promote data-sharing in vehicles
- **Toyota Research Institute** (2017):
 - Test project: Decentralized data exchange for sharing AV driving data
 - With BigchainDB decentralized database, MIT Media Lab
- **Jaguar/Land Rover** (2017):
 - Token “DOVU” to incentivize global marketplace for vehicle data sharing
 - Raised ~\$6M in ICO (Oct. 2017)



TOYOTA
RESEARCH INSTITUTE

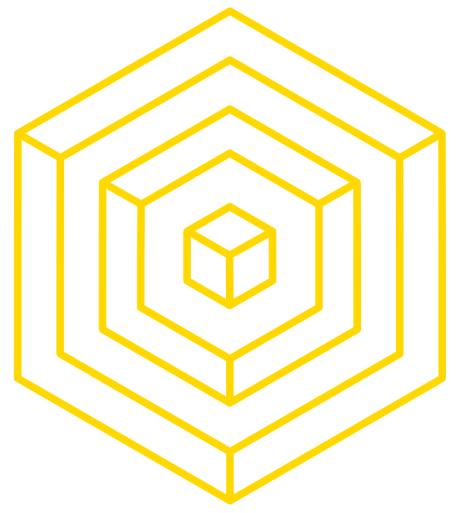




ADDITIONAL USE CASES

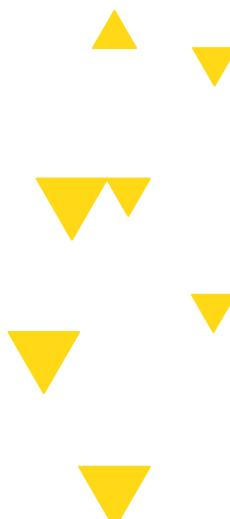
- **Vehicle and auto part supply chain**
 - Streamline and secure data and record management
 - Reduce prevalence of counterfeit parts
 - Keep track of autos post-manufacture
- **Machine-to-Machine (“M2M”) Payments**
 - Cars and trucks could pay to “platoon,” or pass on highway
 - Payments within car
 - Pay external accounts: Tolls, electric vehicle charging stations
 - EV charging: Share&Charge tests in Germany, CA (Slock.it, Innogy)
- **Car Sharing**
 - Slock.it produces hardware & Ethereum-based applications for sharing
 - Decentralized ride sharing (ex. Uber/Lyft) or car sharing (ex. Turo)

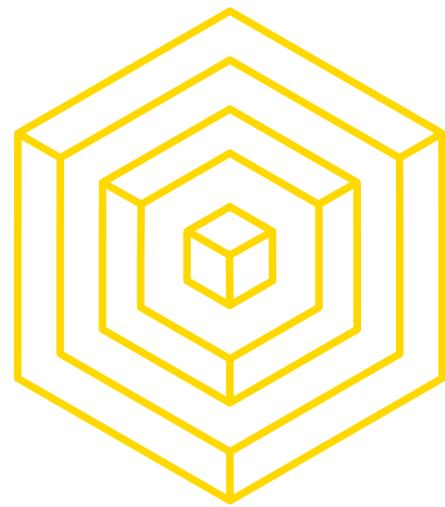




2.2

BIG BANKS & FINANCIAL INSTITUTIONS





RIPPLE & SWIFT

BANK PAYMENTS & MESSAGING

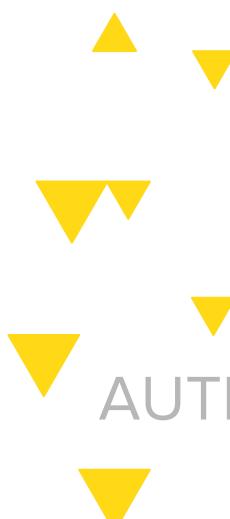
- **Ripple**

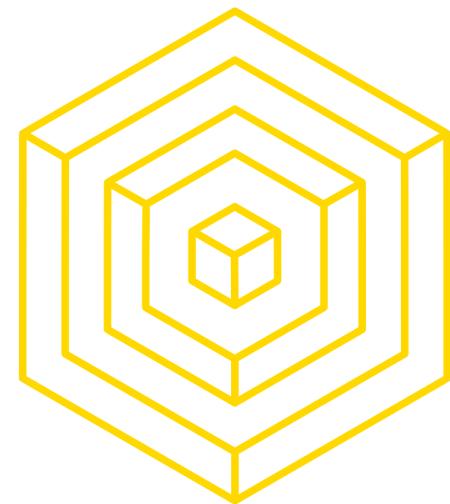
- Allows banks to send money to overseas branches in real time with very low fees via Ripple's blockchain system
- Circumvents & replaces "correspondent banking," replaces old-school payment rails
- Cryptocurrency: XRP



- **Swift**

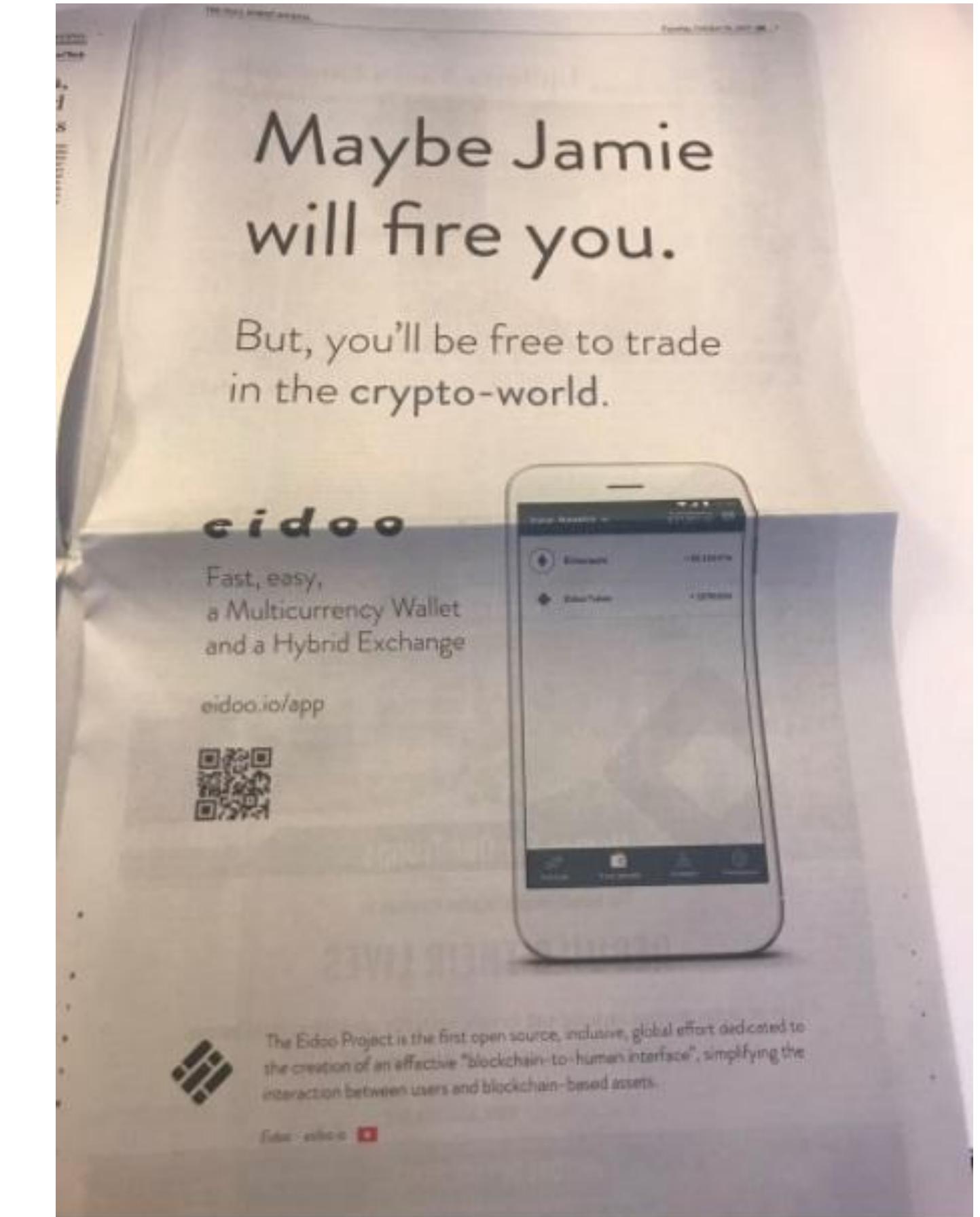
- Existing bank messaging system, used in international payments
- Incumbent-turned-innovator: Successful PoC (2017)
 - Studied replacement of correspondent banking methodology with blockchain-based transactions
 - Direct competition with Ripple's product
 - Participation by BNY Mellon, BNP Paribas, Wells Fargo, other banks

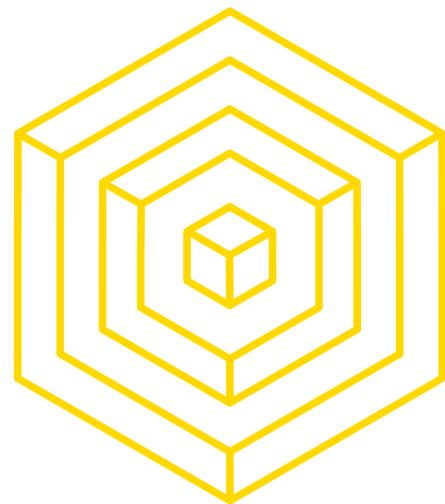




JP MORGAN

- CEO Jamie Dimon condemns Bitcoin very publicly
- JPM participates in EEA, R3, and Hyperledger
- Continues to invest in **Quorum**
 - JP Morgan's hybrid public-private blockchain for fin. transactions
 - Oct. 2017: Added advanced cryptography to augment privacy
 - Zero-knowledge proof cryptography from Zcash partnership
 - obscures details of transactions
 - Oct. 2017: Launched inter-bank payment platform (Interbank Information Network, "IIN")

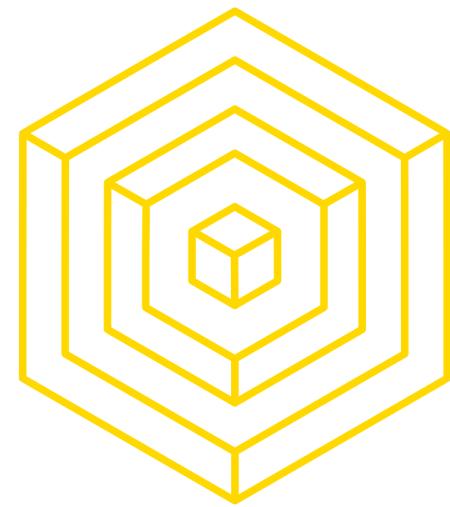




GOLDMAN SACHS

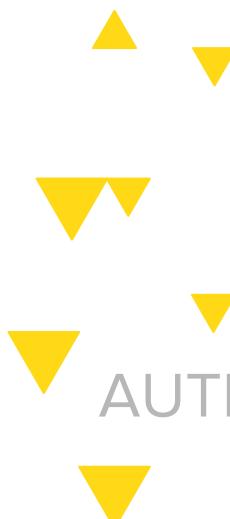
- Cautiously exploring and investing resources little by little
 - Research desks have produced recommendations regarding cryptocurrency investing
 - Wealth management and brokerage desks investigating cryptocurrency
 - News in Oct. 2017: *Might* launch a cryptocurrency trading desk to provide liquidity to institutional investors and funds
 - Investor in Digital Asset Holdings (“DAH”)
 - Internal working group gathered, but waiting to see how blockchain affects financial services
- Will likely invest aggressively in the future once opportunities and risks around blockchain more clear





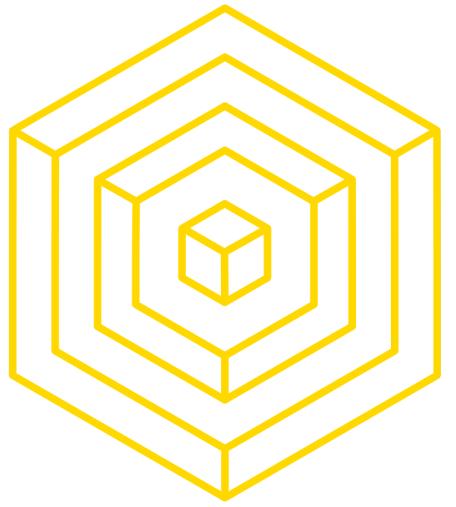
AMERICAN EXPRESS

- Oct. 2017: Applied for patent for new customer rewards program using blockchain for data record-keeping and cryptocurrency for reward points
- Member of Hyperledger consortium
 - *"We're excited to join Hyperledger, as we're looking to take full advantage of blockchain to deliver new and innovative products for our customers and partners, while transforming existing business processes and applications"* - Amex CIO Marc Gordon



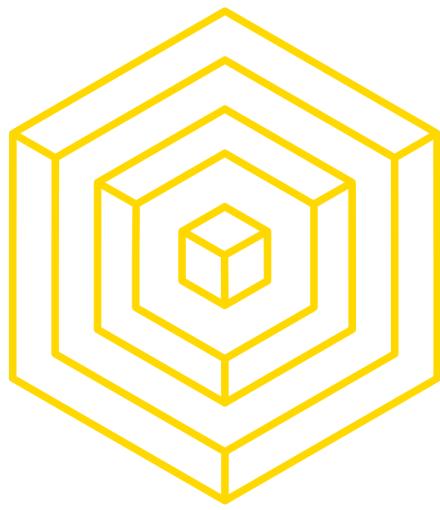
AUTHOR: ASHLEY LANNQUIST

BLOCKCHAIN FUNDAMENTALS LECTURE 10



2.3

OTHER COMPANIES & INDUSTRIES



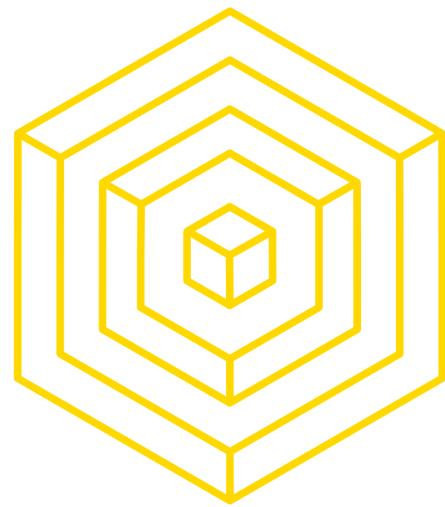
WAL-MART & ALIBABA

- Walmart
 - Trial using Hyperledger to track movement and origins of pork
 - Aims to alleviate food safety problems in China



- **Alibaba**
 - Seeking to use blockchain in supply chain to reduce counterfeiting
 - “*We know where the product comes from, its source, and which retailer it’s coming from*”-Geoff Jiang, head of Ant Financial’s Innovation Lab.
 - Spent 2 years developing in-house private blockchain network



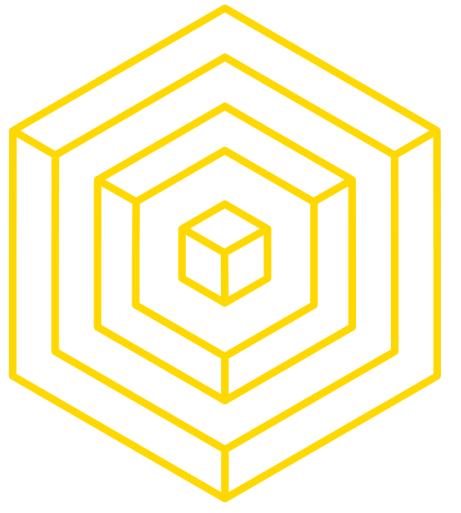


ADDITIONAL CORPORATE TESTS

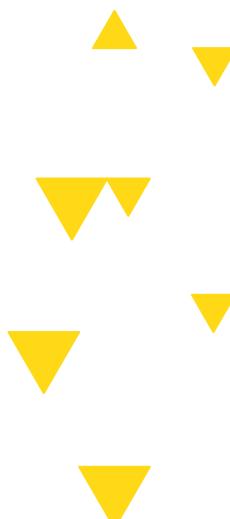
- **Maersk**
 - World's largest shipping company
 - Trial using Hyperledger to track movement of shipping cargo / freight tracking

- **Cisco**
 - Testing blockchain to support tracking & monitoring of IoT devices
 - Identify connected devices, monitor activity, evaluate device trustworthiness
 - Part of Trusted IoT Alliance (consortium)

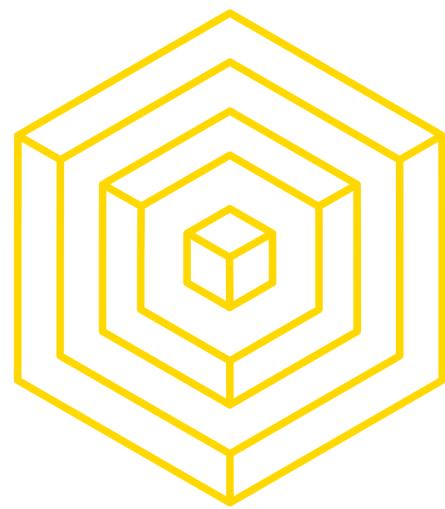




3 BIG NAMES



BLOCKCHAIN FUNDAMENTALS LECTURE 10



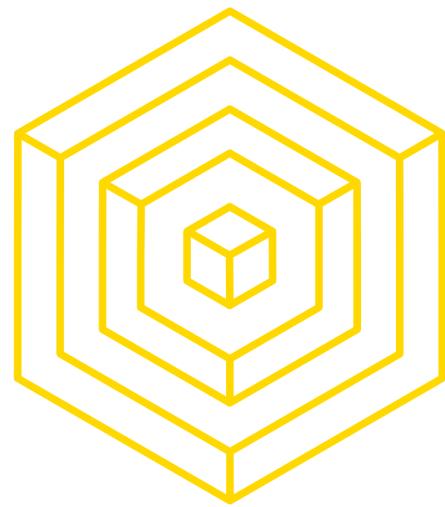
HYPERLEDGER

- Led by Linux Foundation, IBM
- 20+ corporate members, 120+ start-up & ecosystem participants, 20+ institutions
- Consortium to advance blockchain technologies through open-source, collaborative development
- **Focus:** finance, healthcare, supply chain
- Produces enterprise-focused software solutions & tools for implementing blockchain applications, PoCs, solutions, etc.
 - **Hyperledger Fabric**
 - Private network, modular plug-and-play solutions
 - Still in “beta” phase



AUTHOR: ASHLEY LANNQUIST

BLOCKCHAIN FUNDAMENTALS LECTURE 10



CONSENSYS

- Incubator for Ethereum-focused applications, startups, and developer tools
- Founded in 2015 by Joe Lubin (co-founder of Ethereum)
- “Hub-and-spoke” model with shared, central resources and “spoke” ventures
- Supports adoption, ecosystem expansion, network effects for Ethereum
- Multiple divisions & efforts
 - E.g., \$50M venture fund launched Sept. 2017 (ConsenSys Ventures)
 - Ethereal conference & hackathon

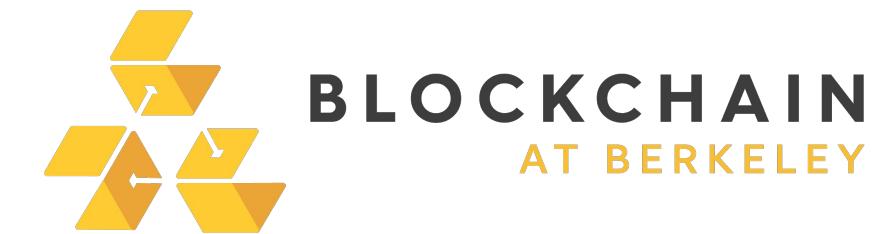


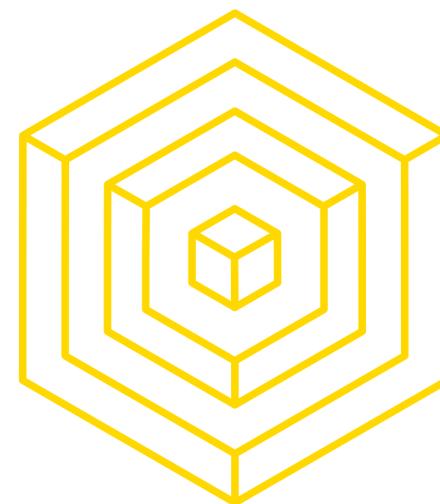
AUTHOR: ASHLEY LANNQUIST



CONSENSYS

BLOCKCHAIN FUNDAMENTALS LECTURE 10





R3CEV

- Tech company & banking consortium with 70+ members
 - Banks, other financial institutions, regulators, trade associations, etc.
 - Focused on developing **Corda**, private open-source distributed ledger platform designed specifically for banks
 - Designed for banks to record, manage, synchronise, support financial transactions and agreements
 - Hopes to power frictionless transactions between banks, supplant current non-interoperable legacy systems
 - Launched Sept. 2015, continuously in development
 - May 2017: \$107M Series A funding round from 40+ institutions

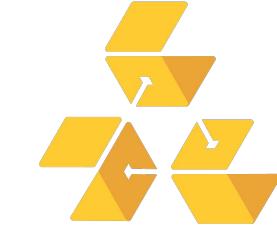
 BNY MELLON

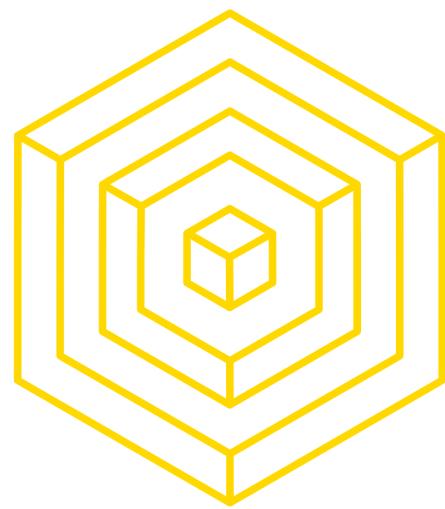
 SOCIETE GENERALE

 RBC
Royal Bank

 citi

 BARCLAYS

 BLOCKCHAIN
AT BERKELEY



ENTERPRISE ETHEREUM ALLIANCE

- Consortium of 150+ Fortune 500 companies, startups, academic institutions, governments
- Organized to innovate and align around enterprise applications of the Ethereum blockchain
 - Provide resources for businesses to learn about Ethereum
 - Provide roadmap for enterprise features & deployment requirements
 - Evolve in tandem with advances in the public Ethereum blockchain
 - Standards, clarity around IP & licensing models for Ethereum open-source code

Price of ether after EEA launch in February 2017



48+ new members in October 2017



AUTHOR: ASHLEY LANNUST
Sources: CoinMarket Cap, EEA website

J.P.Morgan



BLOCKCHAIN FUNDAMENTALS LECTURE 10

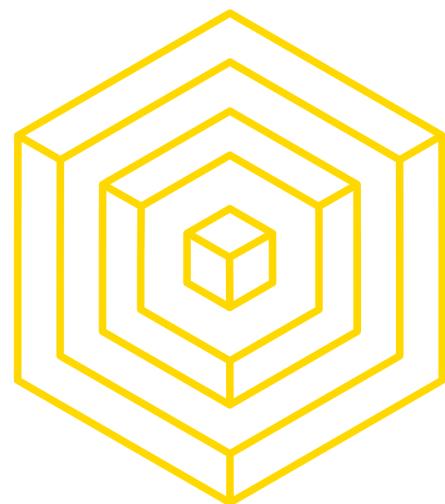
 SBERBANK



 BNY MELLON

 Hewlett Packard Enterprise

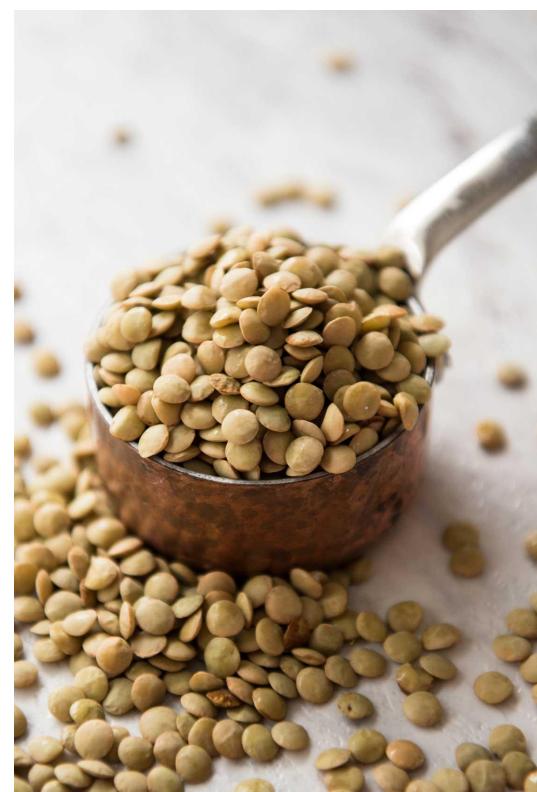
 BLOCKCHAIN AT BERKELEY



UNITED NATIONS

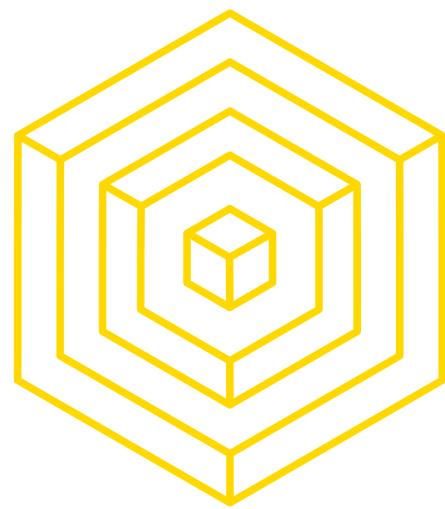
- **UN World Food Program:**

- Record and provide food vouchers to 10,000 Syrian refugees in Jordan
 - Crypto-currency based vouchers to redeem at participating markets



- **UNICEF:**

- Exploring issuing custom currency via ICO to support programs
- Accepts ether donations to its Ethereum address
- ▲ ▼ ○ Venture fund targeting \$10M across 10 blockchain/cryptocurrency startups focusing on remittances, digital identity



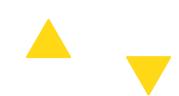
INTERNATIONAL MONETARY FUND

- **Exploration of use cases** (June 2017 paper)
 - Cross border payments
 - Central bank digital currencies

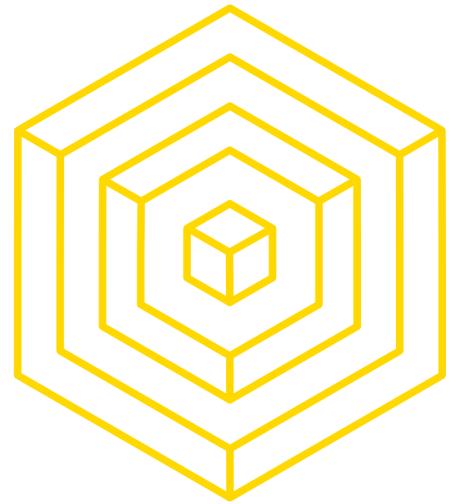
- **Christine Lagarde is a fan**
 - *"I think that we are about to see massive disruptions."*
 - *“Dollarization 2.0:” “Might be useful for countries with weak institutions and unstable national currencies”*



"It may not be wise to dismiss virtual currencies."

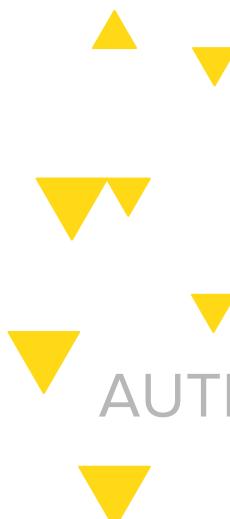


AUTHOR: ASHLEY LANNQUIST



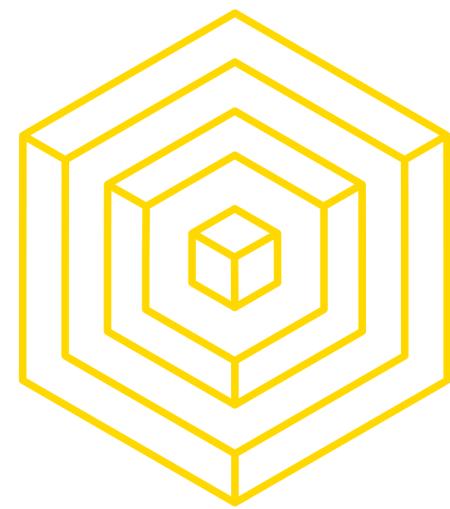
WORLD BANK

- Summer 2017: **Blockchain lab** launched
 - Explore & test 70+ use cases for developing countries
 - Pilot projects to improve governance, social outcomes
 - E.g., voting, land registries, fighting corruption
- Exploring to improve transparency, streamline procedures
 - Track money transferred to member countries
 - Create structured vehicle to raise debt and funds



AUTHOR: ASHLEY LANNQUIST

BLOCKCHAIN FUNDAMENTALS LECTURE 10



GATES FOUNDATION

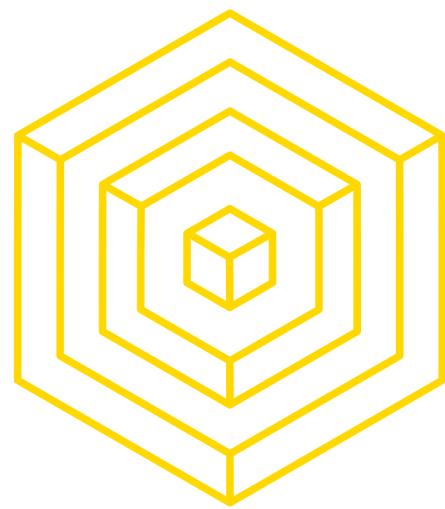
- Studying blockchain for supporting the under-banked since 2015
- “Mojaloop” project (announced Oct. 2017)
 - Supports mobile payment transfers for under-banked populations
 - Provides interoperability layer using Ripple’s Interledger Protocol

BILL &
MELINDA
GATES
foundation



AUTHOR: ASHLEY LANNQUIST

BLOCKCHAIN FUNDAMENTALS LECTURE 10



OTHER INSTITUTIONS

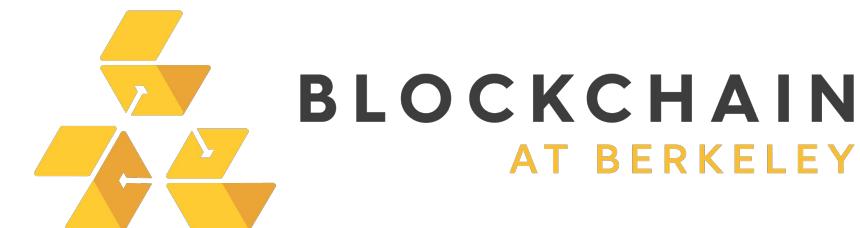
- **U.S. State Department**
 - Exploring use internally to improve efficiencies
 - Investigating use to "advance diplomacy and development objectives"

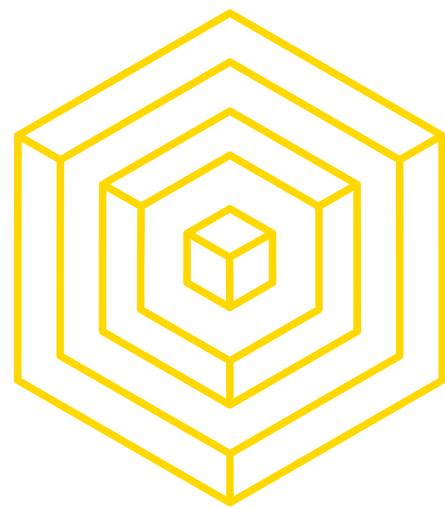
- **European Union**
 - E.U. Commission: 2-year pilot program w/ 500k euro budget
 - Internal research for potential policy recommendations, use cases for E.U.
 - E.U. Parliament: task force

- **U.S. Dept. of Homeland Security**
 - ▶ ▽ ○ \$2.25 million in research grants to companies to explore uses
 - ▼ ○ Funded research lab for development of bitcoin transaction analysis tool



**Homeland
Security**





OTHER MAJOR CONSORTIA

- **Trusted IoT Alliance**
 - To support creation of “secure, scalable, interoperable, & trusted IoT ecosystem”
 - To ease, accelerate, facilitate blockchain IoT use cases
 - I.e., Fund PoCs, coordinate test beds, share open-source code, etc.
 - Chronicled Inc, Slock.it, Cisco, Bosch, Gemalto, BNY Mellon, etc.

- **Spanish banks: Alastria Consortium**
 - “National multi-sector network” hub to facilitate data-sharing
 - BBVA, Banco Santander, Banco Sabadell
 - Other sectors: Gas Natural Fenosa, Mas Movil telecom, Spanish public universities

- **Decentralized Identity Foundation**
 - Promote standards, interoperability across blockchain ID systems & applications
 - Microsoft, Accenture, Civic, uPort, IBM, Hyperledger



AUTHOR: ASHLEY LANNQUIST

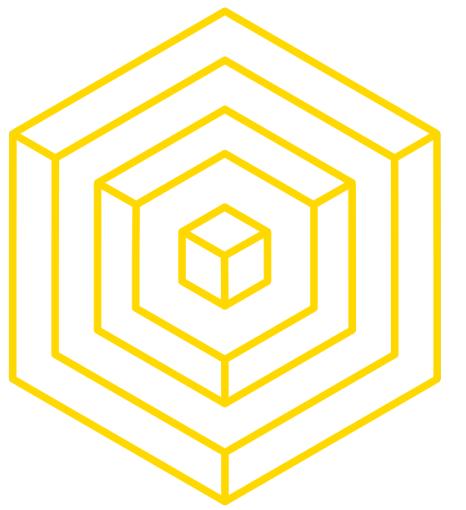
Source: <http://www.iti.com/infrastructure/trusted-iot-alliance-aims-accelerate-union-blockchain-iot>

BLOCKCHAIN FUNDAMENTALS LECTURE 10



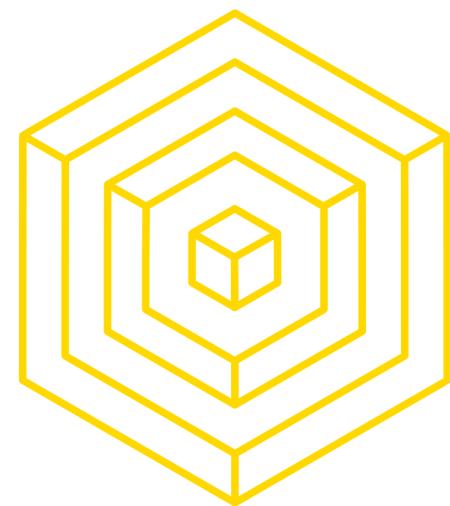
BLOCKCHAIN
AT BERKELEY

**BREAK
SECTION**



4

ICO SCHEMAS/ CULTURE



INITIAL COIN OFFERINGS (ICO)

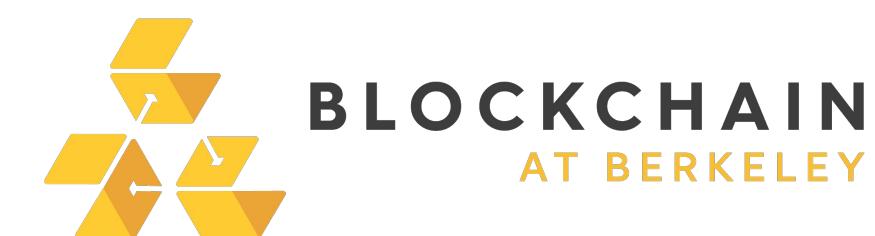
Initial Coin Offering (ICO): A novel, “unregulated” means of raising funds for a blockchain start-up.

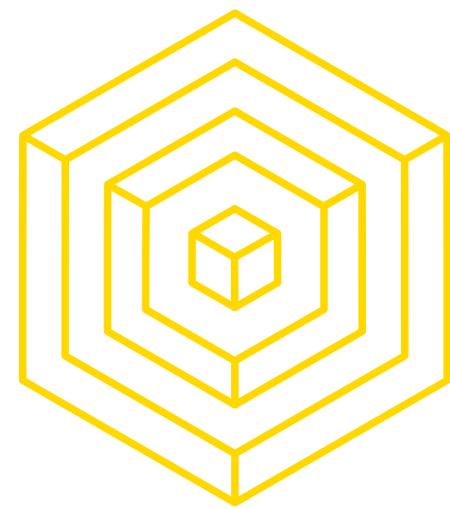
1. sell some amount of their tokens to raise seed funding
 - a. typically represent a unit of value in their network
 2. technology success => tokens will increase in demand, and their value will rise
- value of the tokens defined by amount of faith the community has in the company's success



CØSMOS

INTERNET OF BLOCKCHAINS

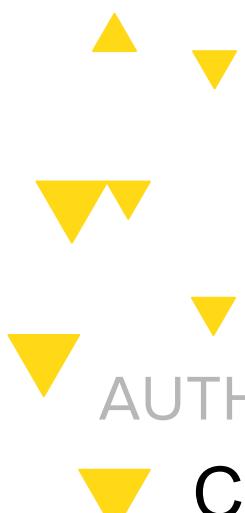




WHAT IS AN ICO?

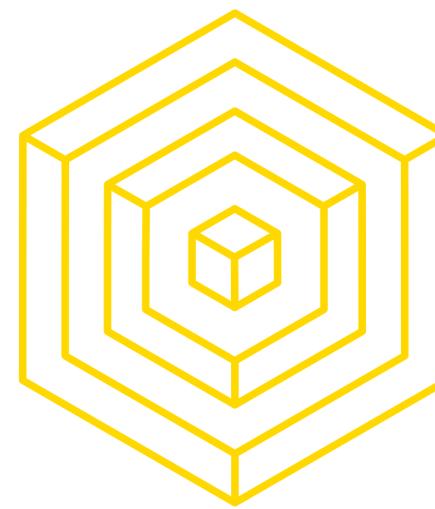
Initial Coin Offering (ICO): Analysis

- Business model innovation
 - Perfectly suited for technologies that only early adopters understand (e.g. infrastructure)
 - Suited for technologies where there is an immediately high capital requirement
 - Answers the question of "How do you fund infrastructure without government?"
- Ideally aligns incentives of development team and early investors
 - Not exactly the case today
- Crowdsale includes details such as how to buy tokens, participating exchanges, token distribution rules, token price (typically measured in BTC / Ether)
- List of ongoing ICOs: <https://www.ico-list.com/>, <https://www.smithandcrown.com/icos/>, <https://www.icalert.com/>



AUTHOR: MAX FANG

Compiled from Outlier Ventures Research "All You Need to Know About Initial Coin Offerings"



ALIGNING INCENTIVES

WHAT'S YOUR INCENTIVE?

Open-source: How it's usually done

- Led by orgs such as Mozilla Foundation and Apache Foundation
- Dependent on donations and volunteers
- The creators often capture only a tiny minority of the value created
 - Thus incentivized to make the software **proprietary**
 - Thus causes technological **lock-in**. Not in the best interests of users

ICO's Innovation

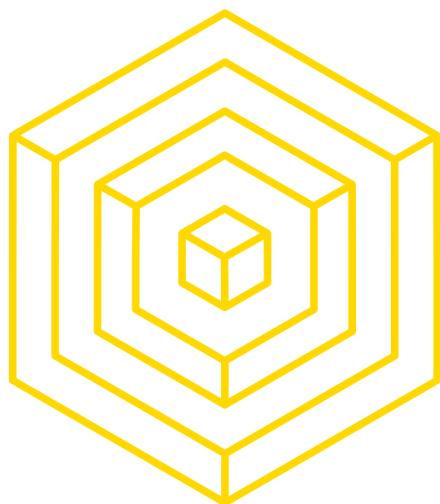
"With tokens, however, the creators of a protocol can “monetize” it directly and will in fact benefit more as **others build businesses on top of that protocol.**” - Albert Wenger, Union Square Ventures

... Maybe a bit too easy to monetize it directly?

AUTHOR: MAX FANG

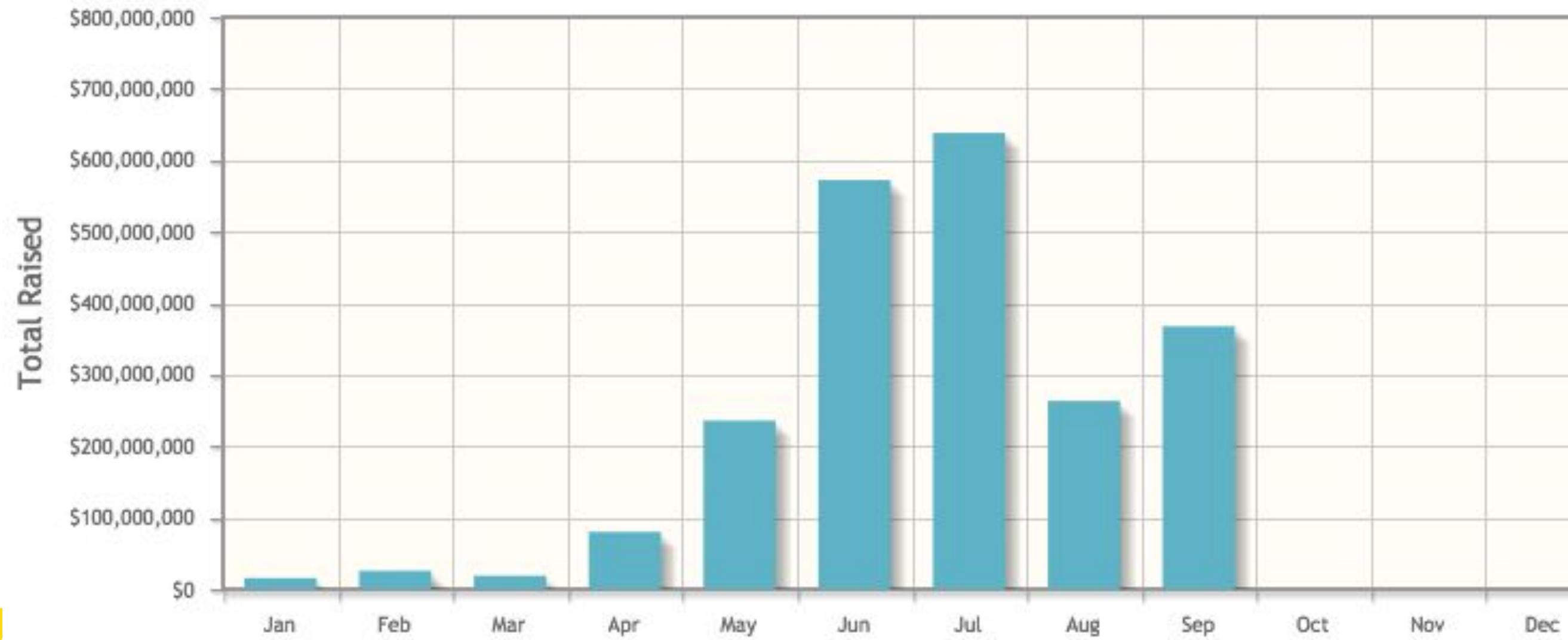
Compiled from Outlier Ventures Research "All You Need to Know About Initial Coin Offerings"

BLOCKCHAIN FUNDAMENTALS LECTURE 10



ICO STATISTICS

ICOs are now more popular than VC for funding blockchain startups.

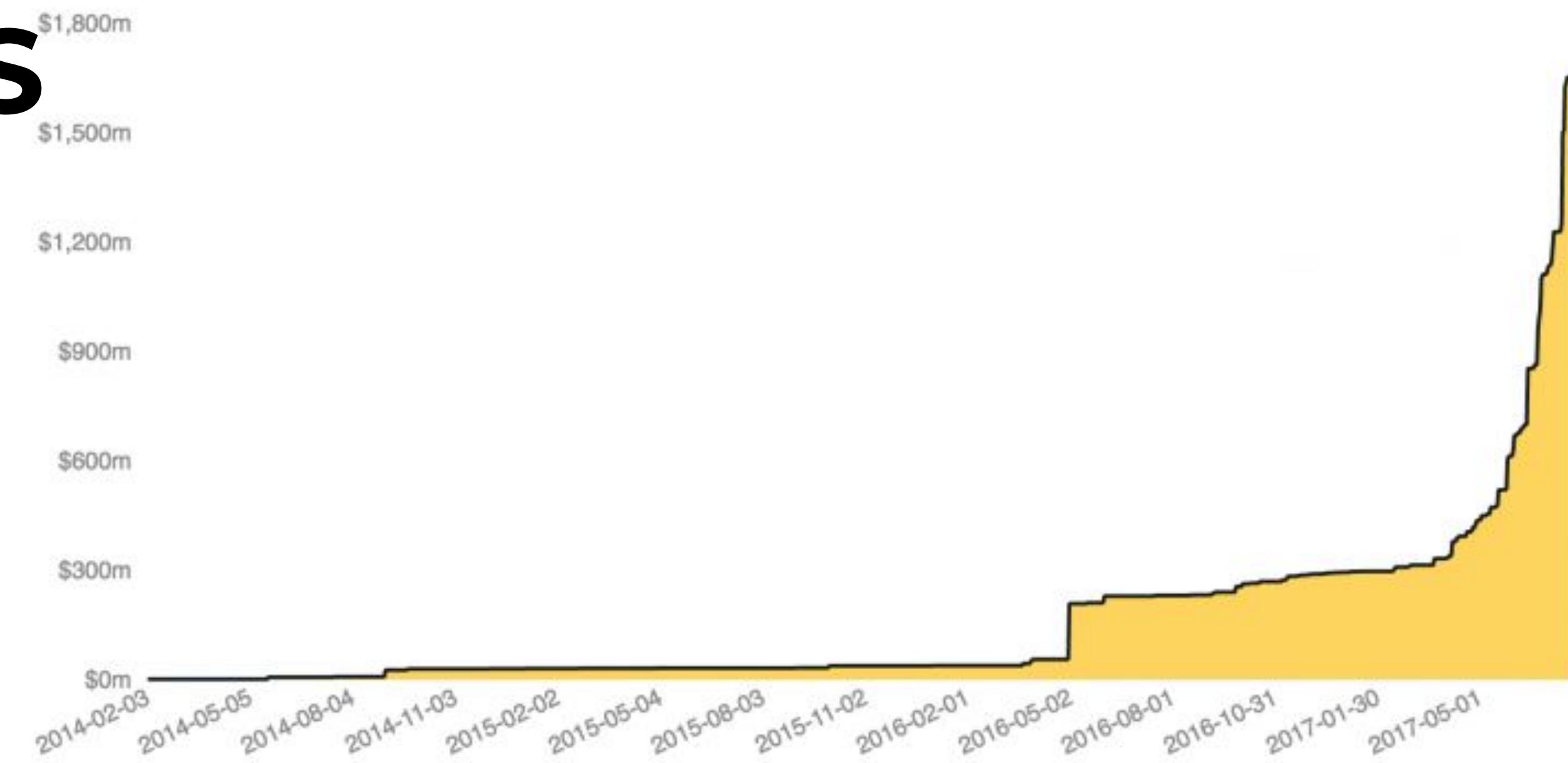


Totals raised are grouped by the ICO closing date and are valued using BTC exchange rate at that time. Data correct on 7th September 2017 14:00 UTC

AUTHOR: MAX FANG

<https://www.coindesk.com/1-6-billion-all-time-ico-funding-climbs-as-record-500-million-invested-in-july/> www.coinschedule.com

All-Time Cumulative ICO Funding

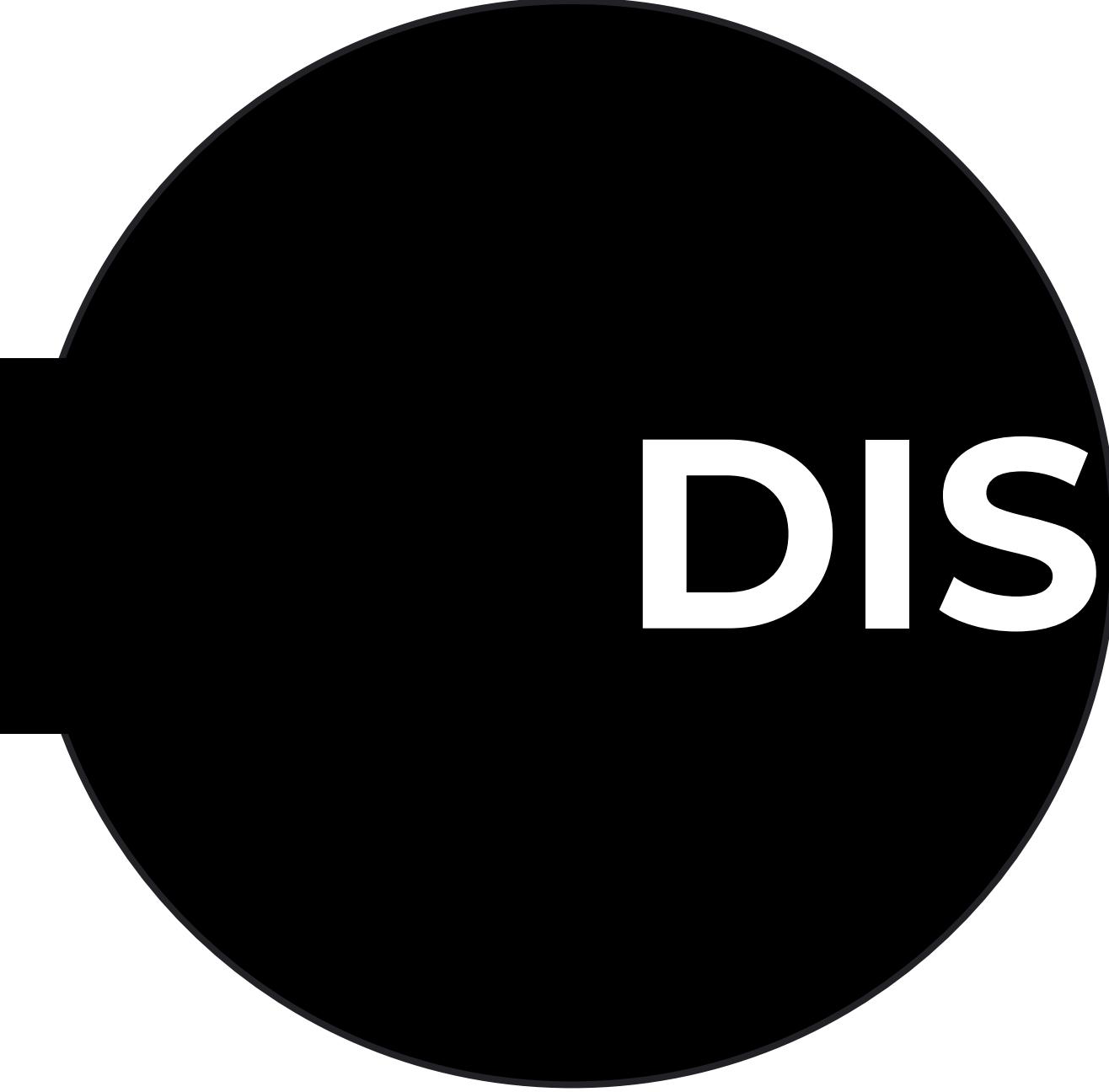


Total Raised: \$2,215,418,369 As of late July 2017, YTD ICO funding is \$2.2Bn compared to ~300m in VC funding

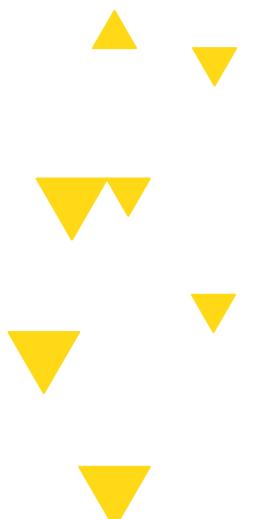
Total Number of ICOs: 149

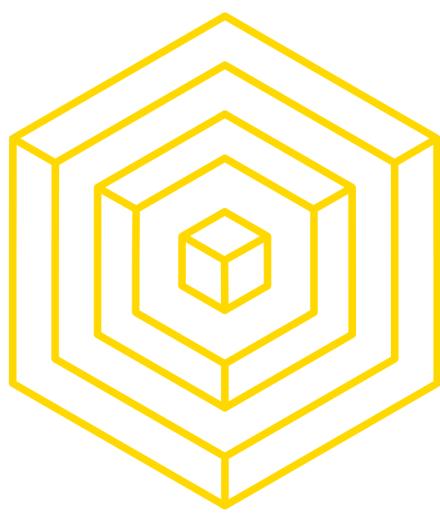
Top Ten ICOs of 2017

Position	Project	Total Raised
1	Filecoin	\$257,000,000
2	Tezos	\$232,319,985
3	EOS Stage 1	\$185,000,000
4	Bancor	\$153,000,000
5	Status	\$90,000,000
6	TenX	\$64,000,000
7	MobileGO	\$53,069,235
8	Sonm	\$42,000,000
9	Aeternity	\$36,960,594
10	Monetha	\$36,600,000



DISCUSSION

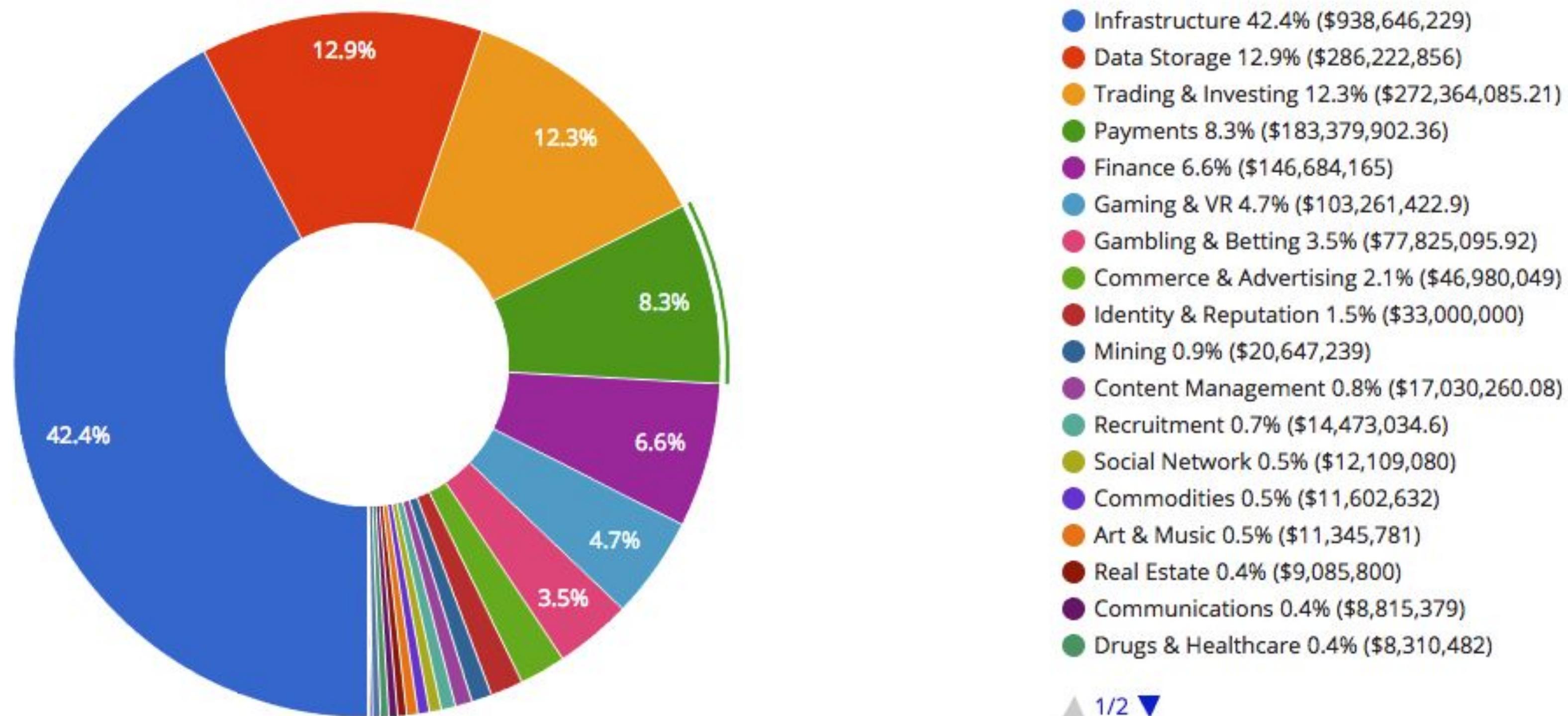




ICO STATISTICS

37

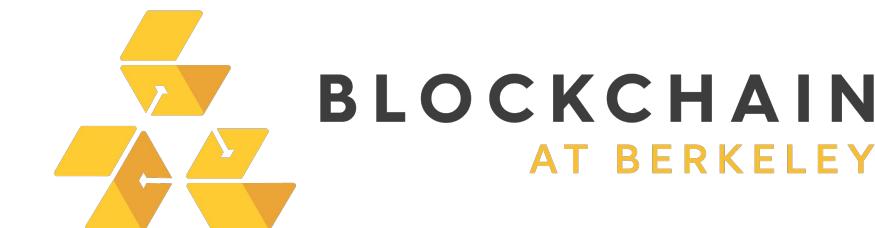
ICOs by Category 2017

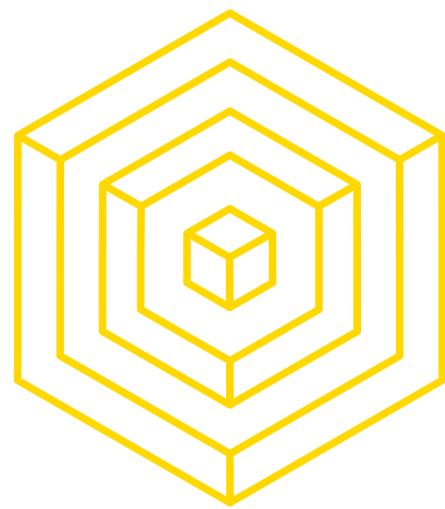


www.coinschedule.com

BLOCKCHAIN FUNDAMENTALS LECTURE 1

AUTHOR: MAX FANG





LEGAL UNCERTAINTY

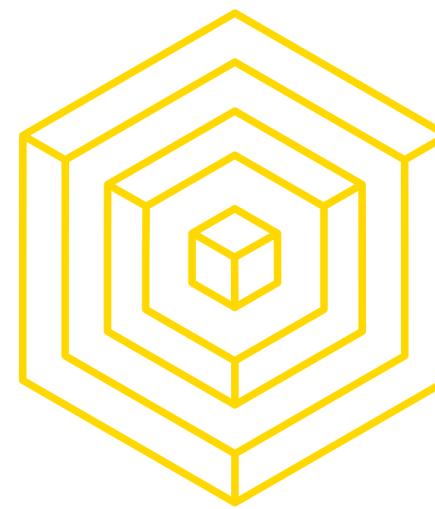
Security or Access Tokens?

- Much of legal uncertainty lies around whether to classify token sales as securities or access tokens
 - No legal precedent yet, but [Coinbase has given some guidance](#)
 - Some function like securities, while others function like access tokens; hard to generalize
 - “When is a club membership a Security?” - Silver Hills Country Club vs. Sobieski - 1961
 - Howey Test: Investment of Money, Common Enterprise, Expectation of Profits
- **Security:** A financial investment vehicle
 - Similar to stock shares in a company
 - “TheDAO” - Considered as a security by SEC July 2017
- **Access Token:** Allows for early access to products and services
 - Similar to Kickstarter donations

Source: <https://www.sec.gov>

AUTHOR: MAX FANG & RONEN KIRSH

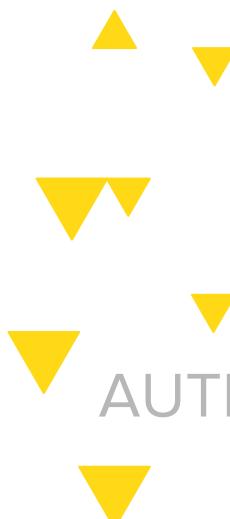
BLOCKCHAIN FUNDAMENTALS LECTURE 10



ALIGNING INCENTIVES

INCENTIVE MISALIGNMENT

- Once a startup raised \$200 million, what incentivize the teams to actually develop the product?
 - No VC or investors to demand their money back
 - No obligation to pay back token holders
- Early adopters usually benefit while late adopter usually lose.
 - In 2017, individuals who invested in ICOs pre-sale tend to return 4-5x on their investment and sell their tokens right away



AUTHOR: RONEN KIRSH

BLOCKCHAIN FUNDAMENTALS LECTURE 10



Alex Morcos
@morcosa

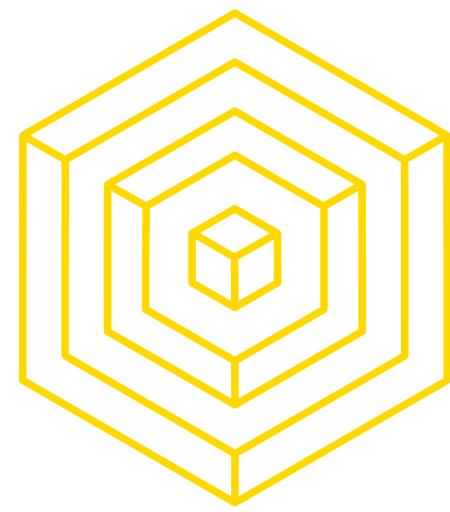
Following

Here's 1 big difference btwn traditional startup funding and ICO's. Founders of failed startups shouldn't come away financially enriched.

12:10 PM - 28 Oct 2017

34 Retweets 124 Likes





ALIGNING INCENTIVES

SOLUTION

Solution:

- Escrow of funds: Milestone-based release.
 - Company create an escrow account with authorized parties who achieve consensus either or not the company delivered on their premises



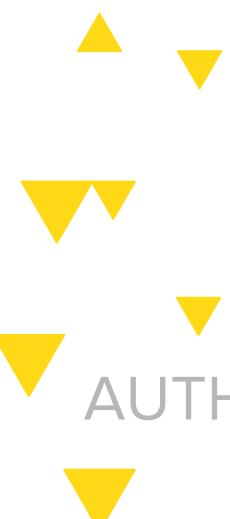
Alex Morcos
@morcosa

Following

Here's 1 big difference btwn traditional startup funding and ICO's. Founders of failed startups shouldn't come away financially enriched.

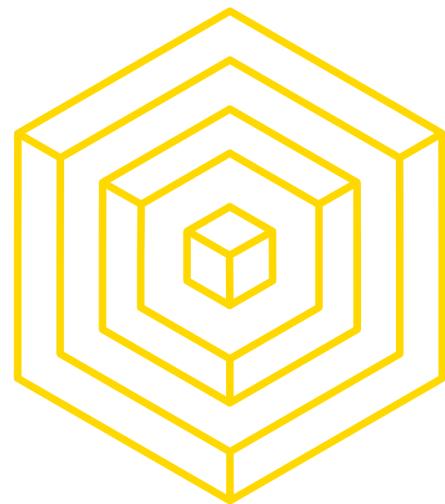
12:10 PM - 28 Oct 2017

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AUTHOR: RONEN KIRSH

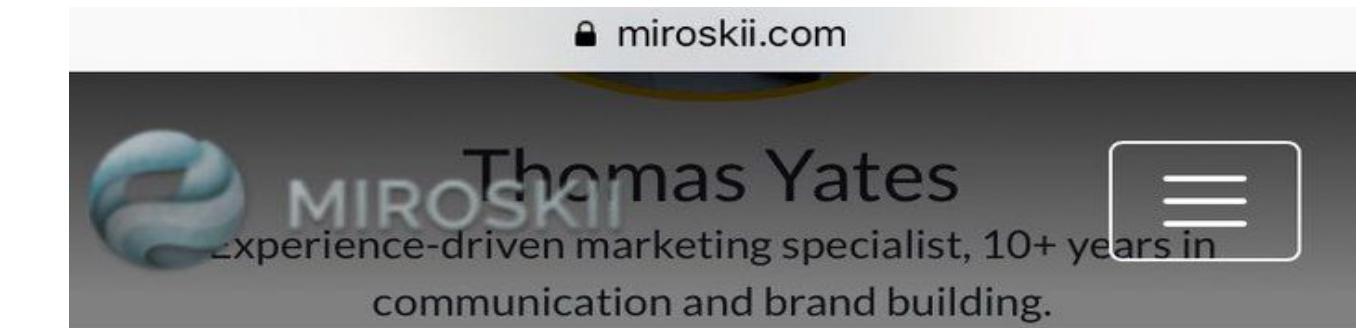
BLOCKCHAIN FUNDAMENTALS LECTURE 10



ICOs: A DOUBLE EDGED SWORD

Double Edged Sword

- Lack of regulatory oversight leads to more scams
- E.g. OneCoin was a 'cryptocurrency' run purely on SQL servers
 - "I paid money for packages, as did everybody else, because they thought there was a blockchain" - Investor of €10,000 into OneCoin
- Often results in centralization
 - Founders and early adopters disproportionately rich and powerful
 - Attracts speculators hoping to get rich quick
 - "Pump and dump"
- Ryan Gosling, famed actor, also alleged graphic designer! Image used for ICO team of [MIROSKII, fake cryptocurrency project](#)



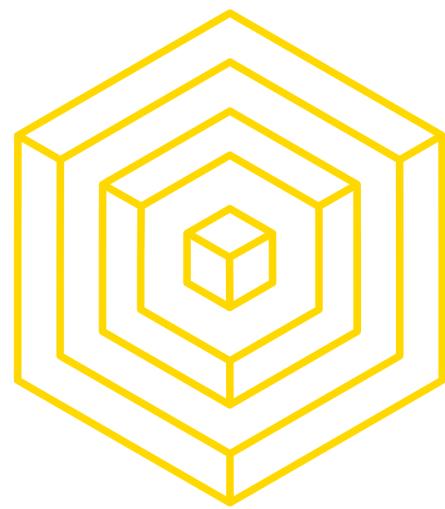
Kevin Belanger

Experienced graphic designer with a clear focus on identities and illustration.



AUTHOR: MAX FANG

Compiled from Outlier Ventures Research "All You Need to Know About Initial Coin Offerings"



LIMITATIONS OF ICOs

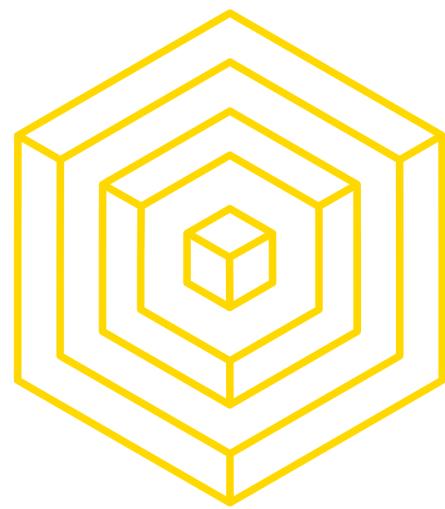
Benefits of Traditional Venture Capital

- Raising money from professional VCs forces discipline and is critical to success
 - Requires creating detailed financials
 - Fundamental assumptions and models constantly questioned
 - Some investors bring more than just capital ("smart money")
 - Venture Capitalists can leverage their experience and connections to play a more active role in the company
 - Can be invaluable to a startup with founders too busy to do business development



AUTHOR: MAX FANG

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LIMITATIONS OF ICOs

Drawbacks of ICOs

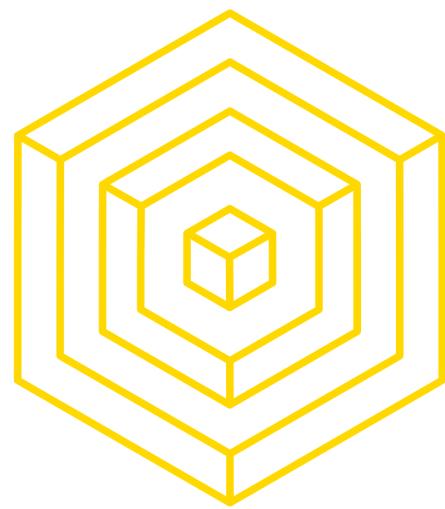
- No central party to carry out due diligence on behalf of investors
 - Venture Capitalists do all the groundwork, and are regulated
 - Thus, this creates risk and is the area of most concern to regulators
- Due diligence for ICOs is assumed to be done by the crowd itself
 - Typically very light: Who really reads the full whitepaper?
 - Led more by emotion and speculation instead of sound business fundamentals

- Early adopters tend to be alike
 - They "drink the Kool-Aid" and don't challenge the project founders with alternative points of view
- Can lead to the distracting need to manage 100s and sometimes 1000s of investors
 - All demanding promises are delivered on time and on budget
 - Can be an overwhelming task for small teams with potential to turn into a PR disaster
 - Many companies prefer to be private because they can avoid the constant scrutiny implicit in going IPO (or ICO)



AUTHOR: MAX FANG

Compiled from Outlier Ventures Research "All You Need to Know About Initial Coin Offerings"



CRYPTOCURRENCY STATISTICS

**Market capitalization
of all tokens and
cryptocurrencies:**

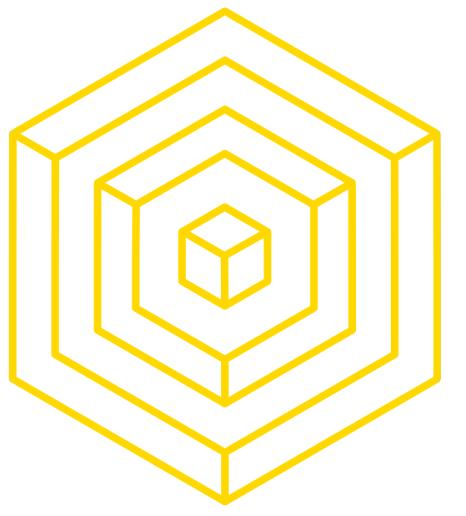
\$147B as of 9/30/17



Source: [Coin Market Cap Global Charts](#)

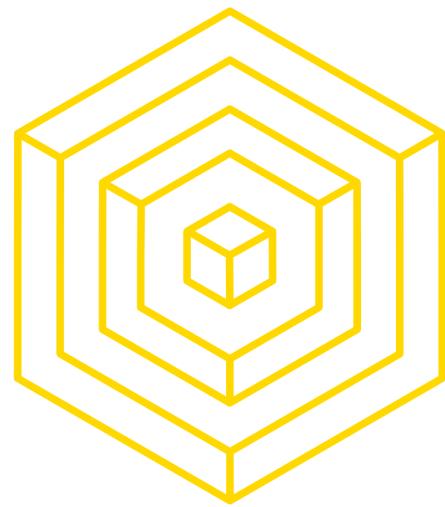
AUTHOR: MAX FANG

BLOCKCHAIN FUNDAMENTALS LECTURE 10



5 LAW & REGULATIONS

BLOCKCHAIN FUNDAMENTALS LECTURE 10

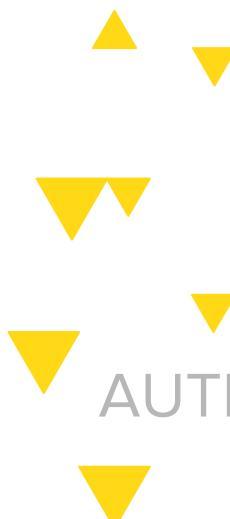


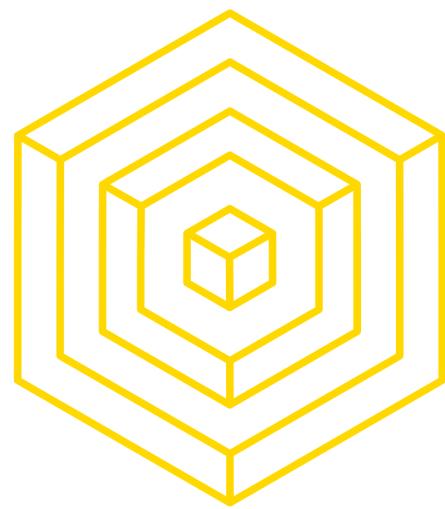
MONEY TRANSMITTER LICENSE (MTL)

Money transmitter: an entity that provides money transfer services or payment instruments.

NYDFS:

- Audited financial statements of the applicant business and any subsidiaries
- Personal financial records of all directors, principal officers, owner or 10% shareholders ("Control Persons")
- Records of occupations for all Control Persons for the last fifteen years, including any disciplinary actions taken by any employer
- List of all lawsuits or criminal complaints against any Control Person in the last fifteen years
- Third-party criminal and civil background checks
- Marital, divorce and familial records, including names of dependents of Control Persons
- Fingerprints of Control Persons





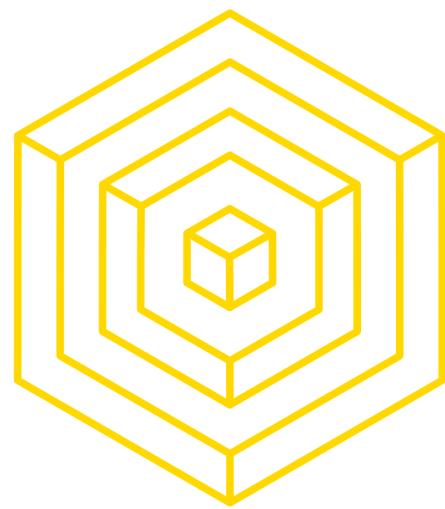
ANTI-MONEY LAUNDERING (AML)

Anti-money laundering (AML): prevention of undetected large flows of money from **crossing borders** or **moving between the underground and legitimate economy**

- Consider motive of Bitcoin/cryptocurrencies: to do precisely this
- Who enforces this? In the US, FinCEN (division of the Treasury) and SEC:
<https://www.fincen.gov/>

Currently under compliance of AML:

- Bitstamp - <https://www.bitstamp.net/aml-policy/>
- Bitfinex - <https://www.bitfinex.com/KYC%20FORM%20ENGLISH%20INTL.pdf>
- Coinbase - <https://coinbase.com/legal/privacy>
- Kraken - <https://www.kraken.com/legal/aml>
- Cryptonit- <https://cryptonit.net/regulations>

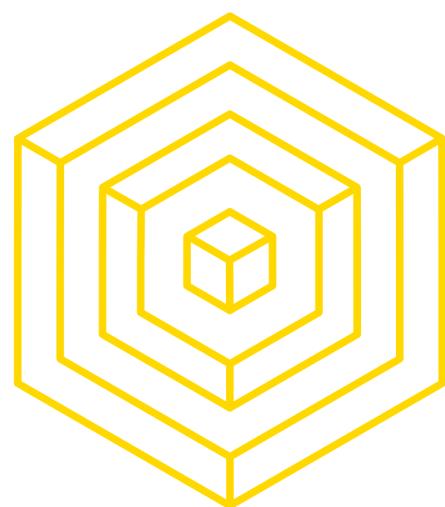


KNOW YOUR CUSTOMER (KYC)

Know Your Customer rules require certain kinds of businesses that handle money to do three things:

- **Identify and authenticate clients** — get some kind of authentication that clients really are who they claim they are and that those claimed identities correspond to some kind of real-world identity. A person shouldn't just be able to walk in and claim they're John Smith from 123 Main Street in AnyTown, USA without some subsequent verification process — they have to provide **reliable identification documents**.
- **Evaluate risk of client** — determine the risk of a certain client engaging in underground activities. This will be based on how the client behaves — how longstanding their business relationship is with the company, how well known they are in the community, and various other factors. KYC rules generally require covered companies to treat clients whose activities seem riskier with more attention.
- **Watch for anomalous behavior** — keep tracks of indication of money laundering or criminal activity. KYC will often require a company to cut off business with a client who looks dodgy or cannot authenticate themselves or their activities as required by the rule.





BITLICENSE

ISSUED BY **NYSDFS**

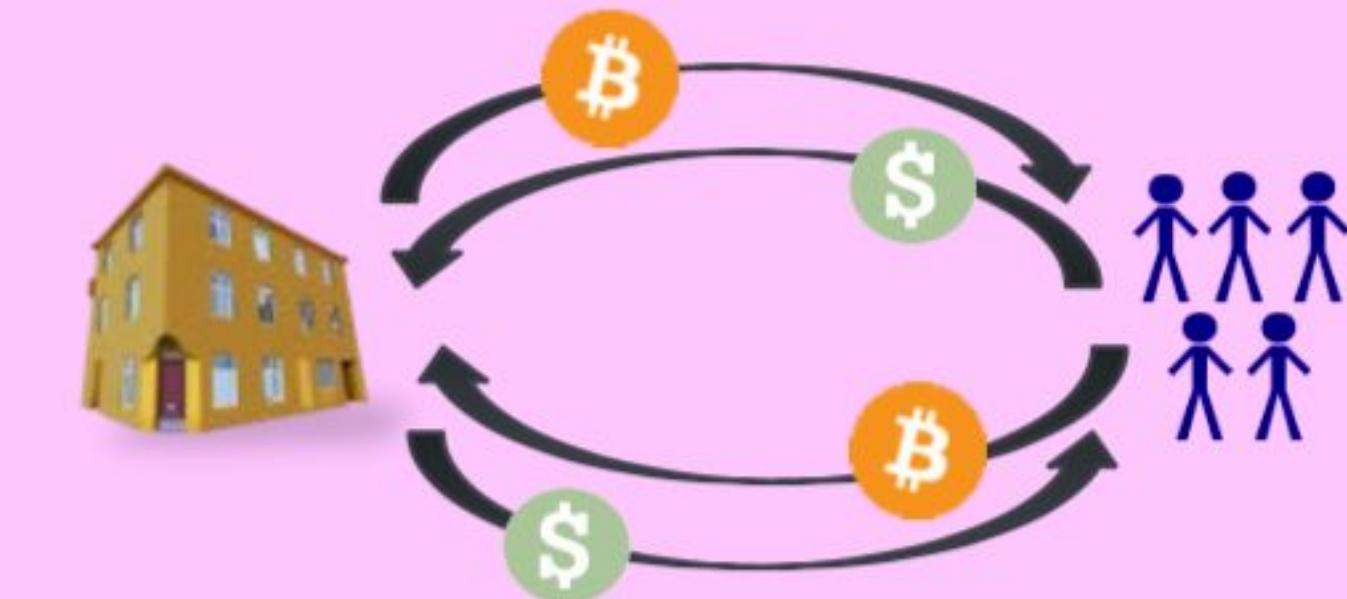
1. Receiving virtual currency for transmission or transmitting it



2. Holding virtual currency for others



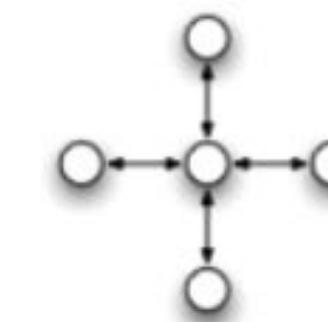
3. Buying and selling virtual currency as a customer business

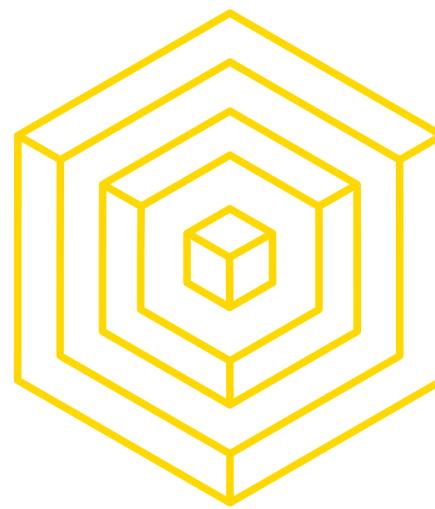


4. Exchange services as a customer business



5. Controlling, administering, or issuing virtual currency





OLD NEWS

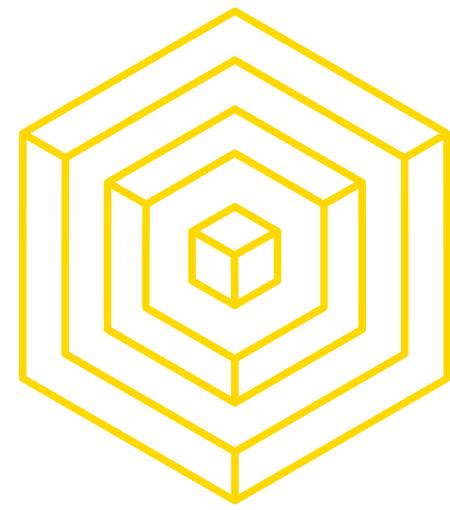
A FAVORITE OXYMORON

ETF: “a marketable security that tracks an index, a commodity, bonds, or a basket of assets like an index fund” (<http://www.investopedia.com/terms/e/etf.asp>)

- Allows people to invest in these items like stocks

Background ([source 1](#) & [source 2](#) [Investopedia]):

- Winklevoss Twins (same ones who sued Mark Zuckerberg) requested to launch a Bitcoin ETF in late 2013
- Bitcoin ETF ruling:
 - Bitcoin described as “unregulated” and not “consistent with the Exchange Act” (<https://www.sec.gov/rules/sro/batsbzx/2017/34-80206.pdf>)
 - Claimed to be traded primarily on “poorly capitalized, unregulated” exchanges outside US, **noting Chinese influence on Bitcoin prices**
 - Representative of entire US government’s perception of Bitcoin
- ▲ ▼ ● Was this rejection entirely bad?
 - Reaffirms Bitcoin as beyond government control, which is *exactly* what gives it power



OLD NEWS

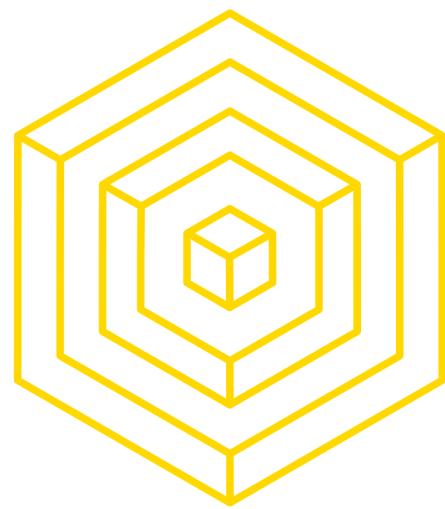
A FAVORITE OXYMORON

“Until the questions [of investor risk from extreme volatility, lack of liquidity and potential market manipulation] identified can be addressed satisfactorily, we do not believe that it is appropriate for fund sponsors to initiate registration of funds that intend to invest substantially in cryptocurrency and related products, and we have asked sponsors that have registration statements filed for such products to withdraw them.” Dalia Blass Jan 18.



AUTHOR: GILLIAN CHU

BLOCKCHAIN FUNDAMENTALS LECTURE 10



OLD NEWS

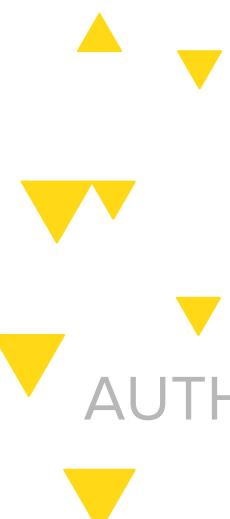
A FAVORITE OXYMORON

Funds to Invest in Blockchain Technology

Fund Name	Net Assets
Amplify Transformational Data Shrg ETF BLOK	\$169.7M
Bitcoin Investment Trust GBTC	\$2.0B
Reality Shares Nasdaq NexGen Economy ETF BLCN	\$85.9M

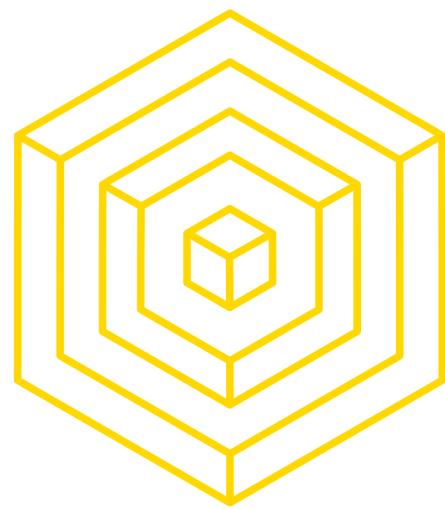
Fund information as of January 29th, 2018

<https://money.usnews.com/investing/cryptocurrency/articles/2018-01-29/cryptocurrency-etf-blok-blcn-gbtc>



AUTHOR: GILLIAN CHU

BLOCKCHAIN FUNDAMENTALS LECTURE 10



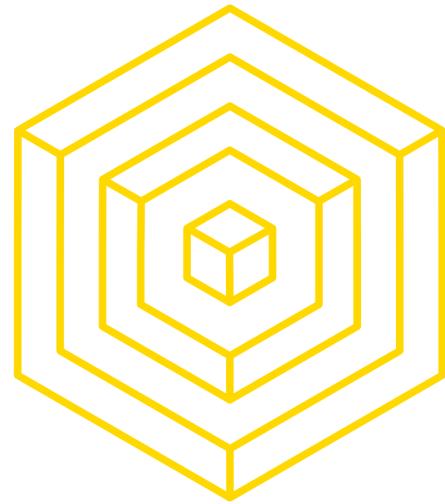
PERSPECTIVES

STATES

- A bill containing the following was passed in **Arizona**:
[\(http://www.coindesk.com/arizona-governor-signs-blockchain-bill-law/\)](http://www.coindesk.com/arizona-governor-signs-blockchain-bill-law/)
 - “A signature that is secured through blockchain technology is considered to be in electronic form and to be an electronic signature ... A record or contract that is secured through blockchain technology is considered to be in an electronic form and to be an electronic record.”
- **Vermont** approved blockchain data as representative of real facts and evidence permissible in court
[\(http://www.coindesk.com/vermont-blockchain-timestamps-approval/\)](http://www.coindesk.com/vermont-blockchain-timestamps-approval/)
 - “A digital record electronically registered in a blockchain shall be self-authenticating pursuant to Vermont Rule of Evidence 902, if it is accompanied by a written declaration of a qualified person, made under oath, stating the qualification of the person to make the certification and: (A) the date and time the record entered the blockchain; (B) the date and time the record was received from the blockchain; (C) that the record was maintained in the blockchain as a regularly conducted activity; and (D) that the record was made by the regularly conducted activity as a regular practice.”



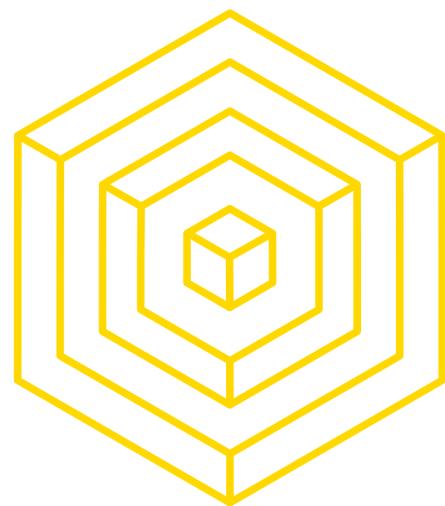
AUTHOR: NADIR AKHTAR



PERSPECTIVE

GLOBAL (GOOD)

- London looks to give a more positive embrace to Bitcoin, seeing it as progress instead of primarily fearing circumvention (although they certainly want regulation according to AML/KYC standards)
(<http://www.pymnts.com/in-depth/2015/will-london-be-the-fintech-hub-for-bitcoin>)
- Switzerland looks to allow for the development of a new type of banks particularly called “crypto-banks”
(<http://www.coindesk.com/swiss-government-paving-way-bitcoin-blockchain-banks/>)
- Again in Switzerland, a small village allegedly known as “Crypto Valley,” meant to rival Silicon Valley in the crypto space
(<http://www.coindesk.com/blockchain-innovation-switzerland-crypto-valley-new-york/>)
- Japan recognizes Bitcoin as a legal currency, prices increase by ~2%
 - ▲ <http://www.businessinsider.com/bitcoin-price-spikes-as-japan-recognizes-it-as-a-payment-method-2017-4>
 - ▼



PERSPECTIVES

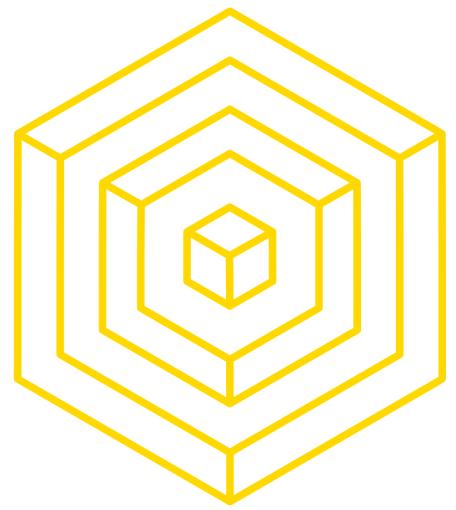
GLOBAL (BAD)

Reasonings (and some punishments) per country for buying, selling, or otherwise using Bitcoin

(<https://www.cryptocoinsnews.com/top-10-countries-bitcoin-banned/>):

- **Bangladesh:** no regulation by central bank ⇒ EVIL!
 - up to **12 years** in prison
- **Bolivia:** illegal to use non-government currency (which happens to include Bitcoin)
- **China (just for banks):** limiting public access to local exchanges
- **Ecuador:** to protect their own electronic currency
- **Iceland:** purchasing digital currency goes against the restriction of currency from leaving the country
- **India:** BTCXIndia (despite complying to AML/KYC) shut down
 - Reversal on ban! <https://cointelegraph.com/news/suddenly-bitcoin-to-be-officially-legal-in-india>
- **Russia:** strong digital currency weakens national currency (Russian ruble), weakening banks & gov't
- **Sweden:** cannot be used to buy scrap metal or other “waste products” (surprisingly popular)
- **Thailand:** labeled illegal due to lack of regulation (but not currently stringently enforced)
- **Vietnam:** banned from use by credit institutions, citing use for illicit activities and high investment risk





HOMEWORK

- Readings and HW: TBD!

