

# Blockchain 101 DLT Ecosystem Cryptocurrencies ICOs & token offerings

December 2017

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DLT Education  
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Robert Schwentker is a technologist and fintech educator. He has extensive training, developer relations, programming & systems experience at financial service organizations like PayPal, American Express & Citigroup. As Founding President of Blockchain University, Robert has educated 1,000+ entrepreneurs and inspired 100 projects globally.

Currently collaborating with **Cisco** on their Blockchain Innovation Lab; Launched an Intro to Hyperledger online course for **Linux Foundation**; Researching blockchain solutions for **UN Women** humanitarian relief projects.




## Agenda

- Blockchain 101:
  - What are blockchains & distributed ledger technologies (DLT)
  - Basics of Bitcoin and Cryptocurrencies
- State backed digital / crypto currencies
- Token offerings & ICOs




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Home > All Subjects > Computer Science > Blockchain for Business - An Introduction to Hyperledger Technologies



### Blockchain for Business - An Introduction to Hyperledger Technologies

A primer to blockchain and distributed ledger technologies. Learn how to start building blockchain applications with Hyperledger frameworks.



Self-Paced  
Starts on October 24, 2017

**Enroll Now**

☒ I would like to receive email from The Linux Foundation and learn about other offerings related to Blockchain for Business - An Introduction to Hyperledger Technologies.

#### About this course

Discover the power of business blockchains and distributed ledger technologies with an overview of Hyperledger and introductions to its key frameworks. All over the global market there are ledgers that organizations and individuals alike must trust. Blockchain technologies record promises, trades, transactions or simply items we never want to disappear, allowing everyone in an ecosystem to keep a

[See more](#)


Length: 8 weeks

Effort: 3-4 hours per week

Price: FREE  
Add a Verified Certificate for \$99

Institution: LinuxFoundationX

[edx.org/course/blockchain-business-introduction-linuxfoundationx-lfs171x](https://edx.org/course/blockchain-business-introduction-linuxfoundationx-lfs171x)



HOMEWORK

# What is Blockchain & DLT?



Media > News

## Blockchain Will Become 'Beating Heart' of the Global Financial System

- Blockchain could profoundly alter the way banks do business, lowering their operating costs and making financial services securer
- Technology could lead to lower fees for consumers, better regulatory oversight
- Collaboration between competing financial institutions will be required to overcome early challenges associated with the technology

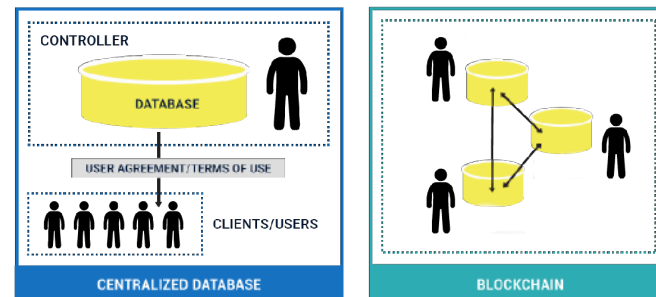


Homework

[www.weforum.org/press/2016/08/blockchain-will-become-beating-heart-of-the-global-financial-system](http://www.weforum.org/press/2016/08/blockchain-will-become-beating-heart-of-the-global-financial-system)

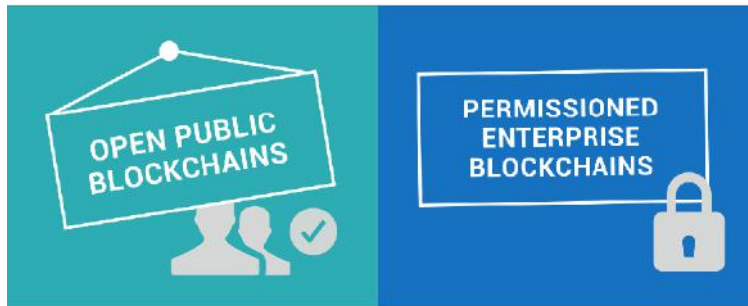
# What is Blockchain?

## CENTRALIZED DATABASES VS. BLOCKCHAIN



# What is Blockchain?

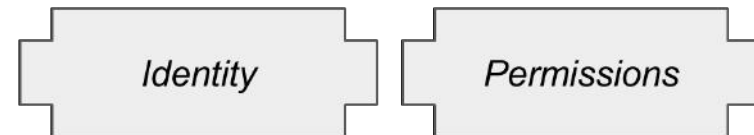
## TYPES OF BLOCKCHAINS



# What is Distributed Ledger Technology (DLT)?

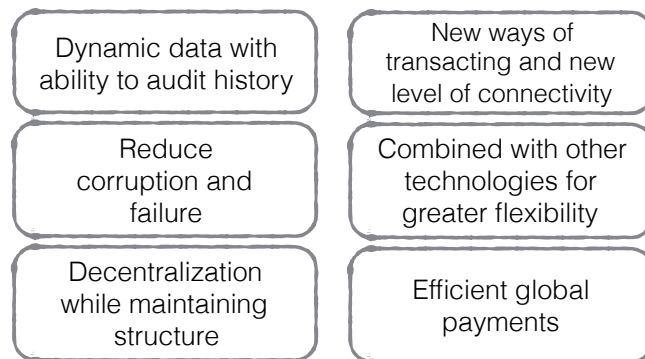
**Distributed ledger** = decentralized database which resides across multiple computer devices and spans across geographical locations

**Distributed Ledger Technology** includes blockchain technologies and smart contracts.



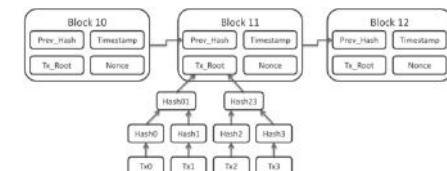
# Why consider DLTs?

*Changes the way we can distribute and record information eliminating the need for trusted parties.*



# Blockchains & DLT

- Bitcoin - 2009
- Ethereum - 2015
- Today 1,000+ blockchains in public
- 1,000's private / permission
  - in labs
  - consortiums



# What is Bitcoin?



A digital currency that can be created, transferred, and held by anyone the world using open source software.



## Six Key Findings on DLT & Financial Services



[weforum.org/docs/WEF\\_The\\_future\\_of\\_financial\\_infrastructure.pdf](https://weforum.org/docs/WEF_The_future_of_financial_infrastructure.pdf)

The World Economic Forum's analysis has yielded six key findings regarding the implications of distributed ledger technology (DLT) on the future of financial services

1. DLT has great potential to **drive simplicity and efficiency** through the establishment of new financial services infrastructure and processes
2. DLT is **not a panacea**; instead it should be viewed as **one of many technologies** that will form the foundation of next-generation financial services infrastructure
3. Applications of DLT will **differ by use case**, each leveraging the technology in different ways for a diverse range of benefits

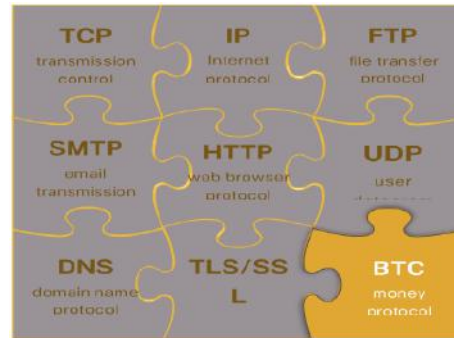
## WEF six key findings (continued)

4. **Digital Identity** is a critical enabler to broaden applications to new verticals; **Digital Fiat** (legal tender), along with other emerging capabilities, has the ability to amplify benefits
5. The most impactful DLT applications will require **deep collaboration** between incumbents, innovators and regulators, adding complexity and delaying implementation
6. New financial services infrastructure built on DLT will **redraw processes** and call into **question orthodoxies** that are foundational to today's business models

## Missing from the Internet – a way to pay

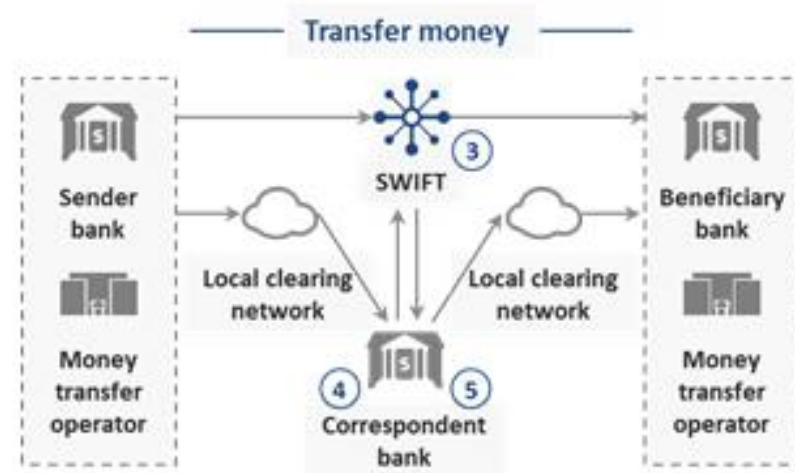
"The one thing that's missing, but that will soon be developed, is a reliable e-cash, a method whereby on the Internet you can transfer funds from A to B without A knowing B or B knowing A, the way I can take a \$20 bill hand it over to you and then there's no record of where it came from"

-- Milton Friedman, 1999

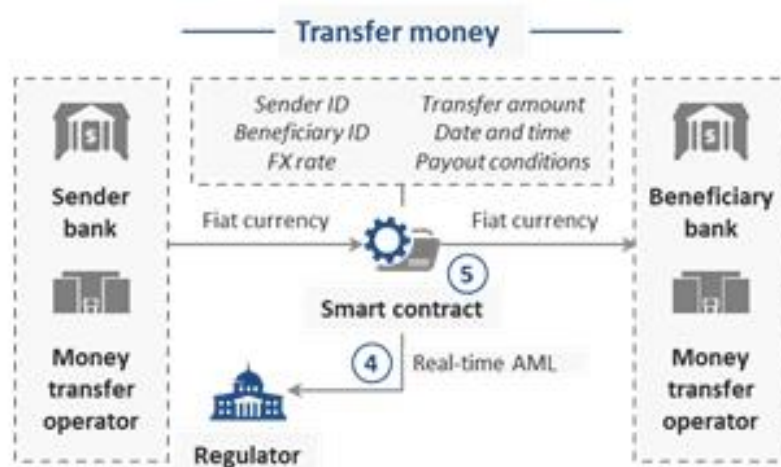


Dan Morehead, Pantera Capital

## How Money Transfers Today via SWIFT



## How Money May Transfers via DLT

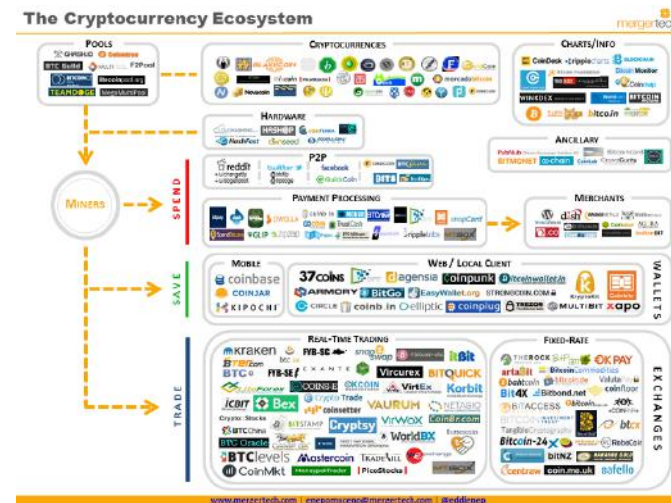


Blockchain / DLT  
Ecosystem

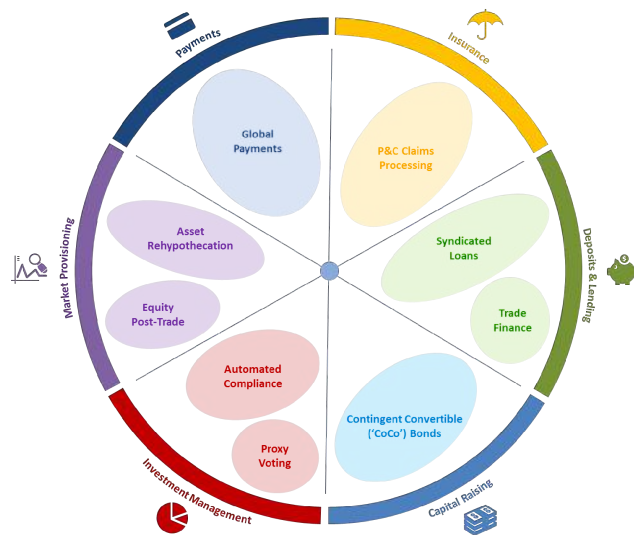
# Blockchain / DLT Ecosystem

- Cryptocurrency Ecosystem - July 2014
- Financial Services Use Cases
- Startup categories
- Countries, Research, Consortia, Bank trials, VC, Central Banks

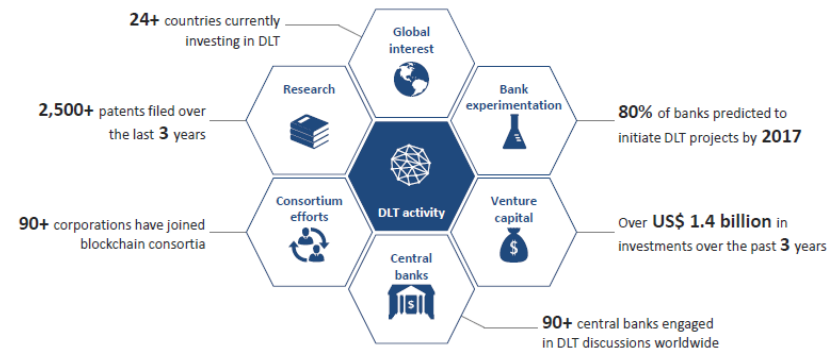
## Cryptocurrency Ecosystem - July 2014



## Financial Services Use Cases



## Countries, Research, Consortia, Bank trials, VC, Central Banks



WEF report: The future of financial infrastructure



## Blockchain Consortia examples

- Ripple: Bank collaborations
- Hyperledger: Open source software focused
- R3: Financial Service company collaborations
- EEA: Open source permissioned Ethereum focused



## Permissioned Blockchain examples

- Ripple [ripple.com](https://ripple.com)
  - XRP cryptocurrency
- Hyperledger projects [hyperledger.org](https://hyperledger.org)
- Chain [chain.com](https://chain.com)
- R3 [corda.net](https://corda.net)
- EEA: Enterprise Ethereum Alliance [entethalliance.org](https://entethalliance.org)



## Blockchain / DLT Ecosystem (cont)

- Stock Exchanges
- Central Bank Digital Currencies (CBDCs)
- Cryptocurrency Market

## VC Investment

- 1000+ startups
  - 1.5 B
- Chinese committing 1.5B over next few years
- Sept 2015 btc stopped
  - Blockchain funding started
- Smart VC pulled back 2016 - less
- ICOs started



# Stock Exchanges

- Linq
- Nasdaq & Chain
- Australia Stock Exchange w/ Digital Assets
- National Stock Exchange of India
- T0 - tee Zero
- Patrick Byrne of Overstock
- Delaware Blockchain Initiative



# State backed digital / crypto currencies

- Fedcoin
  - R3 papers: <http://www.r3cev.com/blog/2017/3/14/b772lwbuk4rkk429h1obxjqbxt3rdc>
- Bank of Canada, Bank of England
- China Coin
- Russian
  - Ethereum Smart Contract



## Coin Market Cap - Spring 2017

788 Currencies / 136 Assets / 4419 Markets  
 Market Cap: **\$98,494,708,220** 24h Vol: **\$5,825,310,088** / BTC Dominance: **41.7%**

#	Name	Market Cap	Price	Circulating Supply	Volume (24h)	% Change (24h)	Price Graph (7d)
1	Bitcoin	\$41,098,238,269	\$2503.99	16,413,100 BTC	\$1,666,270,000	-3.61%	
2	Ethereum	\$25,039,507,761	\$269.76	92,820,393 ETH	\$2,070,660,000	-12.01%	
3	Ripple	\$10,542,959,257	\$0.275335	38,291,387 XRP *	\$283,560,000	-8.52%	
4	Litecoin	\$2,134,682,541	\$41.27	51,730,082 LTC	\$549,761,000	-5.91%	
5	Ethereum Classic	\$1,667,150,152	\$20.06	92,896,807 ETC	\$277,990,000	-8.19%	
6	NEM	\$1,497,726,000	\$0.160414	8,999,999,999 XEM *	\$6,943,420	-6.11%	
7	Dash	\$1,243,996,676	\$168.41	7,386,756 DASH	\$44,405,300	-3.69%	
8	IOTA	\$1,091,748,684	\$0.382781	2,779,530,283 MIOTA *	\$6,414,680	-4.91%	
9	BitShares	\$687,588,719	\$0.264981	2,596,370,000 BTS *	\$104,255,000	-10.92%	
10	Stratis	\$661,638,835	\$6.72	98,440,288 STRAT *	\$11,082,100	-5.97%	
11	Monero	\$635,278,164	\$43.24	14,881,468 XMR	\$15,032,100	-8.81%	

## Coin Market Cap - Oct 31, 2017

1239 Cryptocurrencies / 6304 Markets  
 Market Cap: **\$162,661,437,056** 24h Vol: **\$4,369,328,913** / BTC Dominance: **56.9%**













#	Name	Market Cap	Price	Volume (24h)	Circulating Supply	Change (24h)	Price Graph (7d)
1	Bitcoin	\$107,805,776,376	\$6460.05	\$2,435,720,000	16,657,112 BTC	5.21%	
2	Ethereum	\$29,017,202,352	\$304.01	\$367,894,000	95,448,498 ETH	-1.71%	
3	Ripple	\$7,692,783,214	\$0.199649	\$44,994,800	38,531,538,922 XRP *	-1.56%	
4	Bitcoin Cash	\$7,518,464,885	\$448.81	\$356,128,000	16,751,888 BCH	-0.32%	
5	Litecoin	\$2,974,578,770	\$55.47	\$102,016,000	53,627,707 LTC	-2.01%	
6	Dash	\$2,133,309,901	\$278.67	\$51,982,100	7,655,464 DASH	-2.24%	
7	NEO	\$1,796,899,000	\$27.64	\$63,283,200	65,000,000 NEO *	-4.41%	
8	BitConnect	\$1,755,712,041	\$239.14	\$18,554,000	7,341,713 BCC	4.82%	
9	NEM	\$1,681,434,000	\$0.186826	\$5,838,720	8,999,999,999 XEM *	-6.20%	
10	Monero	\$1,333,768,401	\$87.21	\$29,843,300	15,293,808 XMR	-1.38%	
11	IOTA	\$1,070,488,636	\$0.385133	\$8,525,180	2,779,530,283 MIOTA *	-3.96%	
12	Ethereum Classic	\$1,026,344,501	\$10.58	\$25,965,400	97,007,070 ETC	-2.90%	



Cryptocurrencies: 1320 / Markets: 7025

Market Cap: \$318,545,914,736 / 24h Vol: \$14,035,420,292 / BTC Dominance: 55.9%

## Cryptocurrency Market Capitalizations

#	Name	Market Cap	Price	Volume (24h)	Circulating Supply	Change (24h)	Price Graph (7d)
1	Bitcoin	\$178,129,340,860	\$10,657.90	\$7,050,410,000	16,713,362 BTC	8.99%	
2	Ethereum	\$44,205,625,556	\$460.13	\$1,297,780,000	96,071,826 ETH	7.58%	
3	Bitcoin Cash	\$24,177,074,105	\$1,436.35	\$1,055,910,000	16,832,300 BCH	11.81%	
4	Ripple	\$9,854,470,894	\$0.255146	\$200,727,000	38,622,870,411 XRP *	6.68%	
5	Dash	\$6,111,814,122	\$791.49	\$308,943,000	7,721,819 DASH	4.99%	
6	Litecoin	\$5,136,587,650	\$94.98	\$490,425,000	54,062,608 LTC	15.34%	
7	Bitcoin Gold	\$5,087,935,193	\$304.99	\$145,246,000	16,682,411 BTG	7.12%	
8	IOTA	\$3,861,073,311	\$1.39	\$131,998,000	2,770,530,283 MIOTA *	8.75%	
9	Cardano	\$3,223,616,388	\$0.124334	\$90,195,500	25,927,570,539 ADA *	8.90%	
10	Ethereum Classic	\$2,969,433,852	\$30.31	\$992,608,000	97,980,745 ETC	19.48%	
11	Monero	\$2,883,195,526	\$186.93	\$72,782,100	15,423,602 XMR	11.93%	
12	NEO	\$2,293,681,000	\$35.29	\$91,970,700	65,000,000 NEO *	12.53%	

## Tokens, ICO\$, ITOs

## What is an ICO?

- Crowd raise
- Token or currency
- New currency:
  - Using existing token:
    - erc20, btc fork
  - Using new ledger
    - Examples (...tezos last)





































## What is a token sale?

- Team
- White paper + Code
- Sale announcement - kickstarter
  - Ethereum commonly used ERC20 token standard
- Often a foundation for Governance
  - team, foundation, investors, users
  - marketing



# TokenMarket

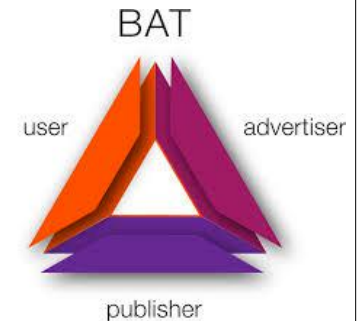
Showing 469 assets

Status	Name	Symbol	Description	
 	 <b>AppCoins</b>	APPC	Distributed and Trusted App-based Transactions Protocol	
 	 <b>Casha</b>	CAS	The Banking Platform for the Next Billion	
 	 <b>Globitex GBX</b>	GBX	Institutional Grade Spot and Derivatives Exchange in Bitcoin	
 	 <b>SimplyVital Health</b>	HLTH	Powering True Care	
 	 <b>STK</b>	STK	A New Cryptocurrency for Instant Payments	
 	 <b>Matrix</b>	MTX	A decentralized collaboration platform	
 	 <b>Edgeless</b>	EDG	Decentralized Casino	
 	 <b>Ox</b>	ZRX	The protocol for decentralized exchange	
 	 <b>1World Online</b>	1WO	Blockchain-powered Engagement & Monetization Platform for Publishers &	

[tokenmarket.net](http://tokenmarket.net)

# BAT

- Brendan Eich
- Javascript, Firefox
- \$35MM
- 24 seconds
- Blockchain based Digital Advertising



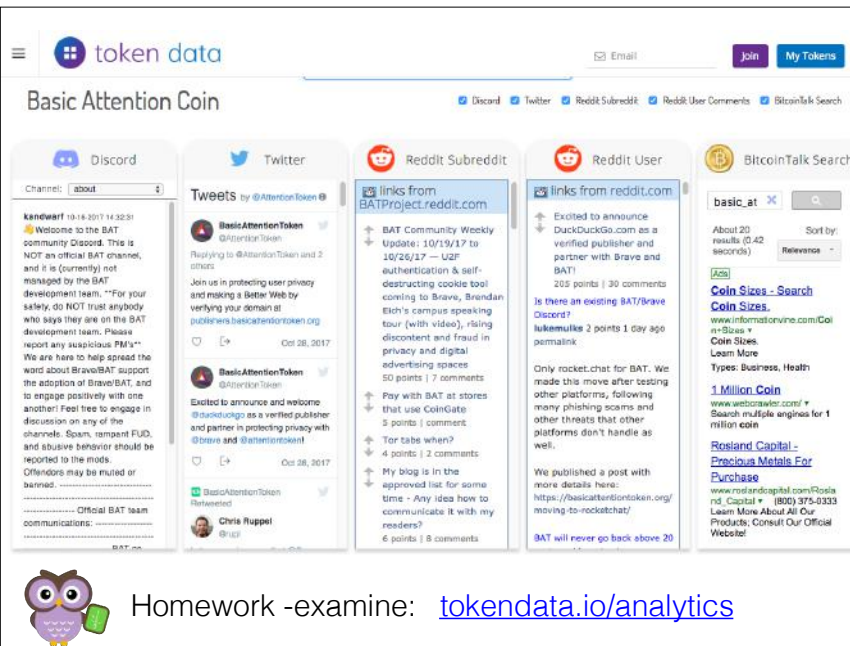
<https://basicattentiontoken.org>

# Civic



- Vinny Lingham
- Gyft
- Pre sale
- \$33 MM
- Blockchain based Identity Verification

<https://tokensale.civic.com>



The screenshot shows the 'token data' website interface. At the top, there's a navigation bar with 'token data', 'Email', 'Join', and 'My Tokens'. Below this, the main section is titled 'Basic Attention Coin' and includes social media links for Discord, Twitter, Reddit Subreddit, Reddit User, and BitcoinTalk Search. The content area displays various tweets and links related to BAT, including announcements about the BAT community, updates on the BAT project, and discussions about the BAT ecosystem. At the bottom left, there's a small owl icon.

Homework -examine: [tokendata.io/analytics](http://tokendata.io/analytics)

# Numer.ai



## NUMERAI

- Hedge fund
- VC funding
- 12000 Data scientists
- 1 MM crypto tokens - Numeraire

# Storj

- Decentralized storage like Amazon EC2
- Before ethereum in 2014
- Second token sale
- Product, revenue, customers
- \$30mm

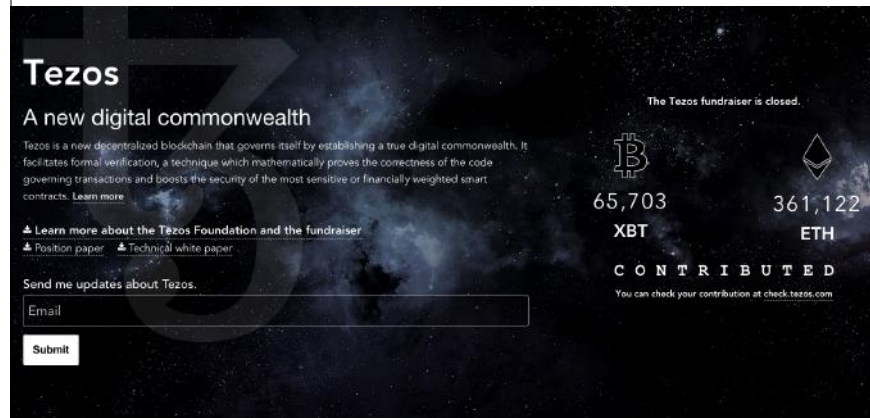


# Golem

- Golem Network
- First decentralized global market for computing power
- \$8.6 MM
- 29 minutes
- Golem Network Token (GNT)



# Tezos ICO completed



# Polychain

- Olaf Carlson - Wee
- Founding team - Coinbase
- Polychain is a HEDGEFUND
- Protocols Trillions



# Protocol Labs

- Juan Benet
- IPFS
- Filecoin
- Coinlist



**Bart Stephens**  
@pbartstephens

Follow

**#Crypto** has created \$150 B of liquid value in 1 yr w/o SandHill. That is the illiquid value of **@Uber**, **@AirBnB**, **@SpaceX** **@pinterest** **@dropbox**

7:58 PM - 26 Oct 2017

43 Retweets 104 Likes



6

43



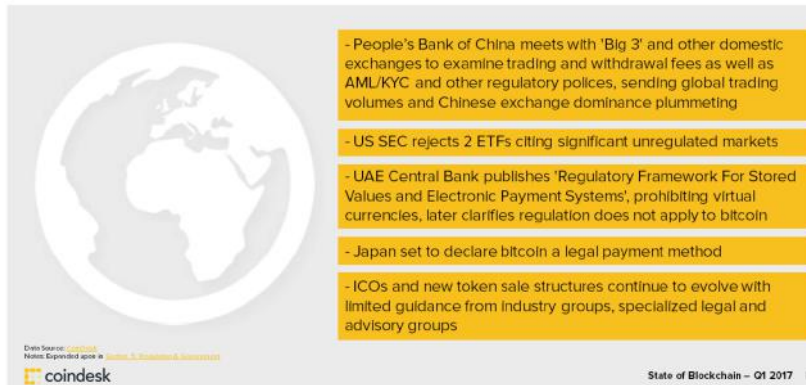
104



Q1 2017 Regulatory snapshot

US Fed Prosecutor on:  
Silk Road & Tezos

# Regulatory & Government Trends - Q1 2017



Kathryn Haun



- Kathryn Haun, US Dept. of Justice
- Tigran Gambaryan, IRS Criminal Investigations
- Catherine Pelker, FBI
- Jason Weinstein, Steptoe & Johnson
- Jerry Brito, CoinCenter

Haun said the **US Dept. of Justice** had used **blockchain analysis** in its Ripple investigation and during the **investigation** of **Silk Road**'s Baltimore Task Force, which led to the identification of **illicit activity** carried out **by former agents Carl Mark Force** and **Sean Bridges**.

[coindesk.com/trust-law-enforcement-and-killer-apps-consensus-2015-morning-sessions](http://coindesk.com/trust-law-enforcement-and-killer-apps-consensus-2015-morning-sessions)



## Trust, Law Enforcement and Killer Apps: Consensus 2015 Morning Sessions

Sep 10, 2015 at 23:57 UTC by Yessi Bello Perez

[coindesk.com/trust-law-enforcement-and-killer-apps-consensus-2015-morning-sessions](http://coindesk.com/trust-law-enforcement-and-killer-apps-consensus-2015-morning-sessions)



NOV 1, 2016 @ 08:00 AM 8,183

## Federal Prosecutor Kathryn Haun On How Criminals Use Bitcoin -- And How She Catches Them



Laura Shin, FORBES STAFF  
FULL BIO

[forbes.com/sites/laurashin/2016/11/01/federal-prosecutor-kathryn-haun-on-how-criminals-use-bitcoin-and-how-she-catches-them](https://forbes.com/sites/laurashin/2016/11/01/federal-prosecutor-kathryn-haun-on-how-criminals-use-bitcoin-and-how-she-catches-them)



Kathryn Haun @katie\_haun · Oct 27

Acrimony over \$232m ICO set to intensify regulatory scrutiny  
[ft.com/content/fcb16026-b45a-11e7-aa26-bb002965bce8](https://ft.com/content/fcb16026-b45a-11e7-aa26-bb002965bce8) via @FT



**Acrimony over \$232m ICO set to intensify regulatory scrutiny**

Tezos, one of the largest cryptocurrency fundraisings to date, is mired in controversy

[ft.com](https://ft.com)

[https://twitter.com/katie\\_haun/status/923956627828379648](https://twitter.com/katie_haun/status/923956627828379648)

### Kathryn Haun

@katie\_haun

Advise tech companies and teach  
@Stanford. Board of Directors  
@Coinbase. Fmr federal prosecutor  
@JusticeDepartment, alum of @Stanford,  
@USSupremeCourt and w/AMK

"I suspect the regulators will wait and take their time and then make an example of one of the really big ICOs, one in the \$100m plus range," said Ms Haun.

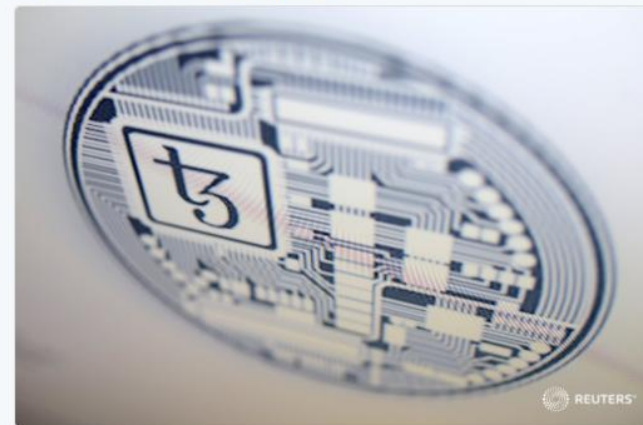
[ft.com/content/fcb16026-b45a-11e7-aa26-bb002965bce8](https://ft.com/content/fcb16026-b45a-11e7-aa26-bb002965bce8)

Kathryn Haun Retweeted



Reuters Tech News @ReutersTech · Oct 18

Why @tezOs, which staged one of the biggest initial coin offerings (ICO) ever, is in danger of falling apart [reut.rs/2gt3bCT](https://reut.rs/2gt3bCT)



20



17





### Tezos (Pre-Launch) Charts



[coinmarketcap.com/currencies/tezos](https://coinmarketcap.com/currencies/tezos)

Bitlegal tracks regulatory landscape of cryptocurrency, digital assets & distributed ledger tech



[bitlegal.io](https://bitlegal.io)

## Bubble



- When will it pop & why?
- When will US SEC get involved?
- Will projects be more subject to milestones?
- As VCs took time to figure out, now Public will too

## Summary

- Blockchain technology is advancing
- 8 - 10 year for consumerization
- Impacting other areas of tech
- CBDC (Central Bank Digital Currencies) are coming
- ICOs are exploding!



# Homework

- [Blockchain.info](http://Blockchain.info)
- [www.weforum.org/press/2016/08/blockchain-will-become-beating-heart-of-the-global-financial-system](http://www.weforum.org/press/2016/08/blockchain-will-become-beating-heart-of-the-global-financial-system)
- [weforum.org/docs/WEF\\_The\\_future\\_of\\_financial\\_infrastructure.pdf](http://weforum.org/docs/WEF_The_future_of_financial_infrastructure.pdf)
- Fedcoin
  - R3 papers: <http://www.r3cev.com/blog/2017/3/14/b772lwbuk4rkk429h1obxjqbxt3rdc>
- [tokenmarket.net](http://tokenmarket.net)
- [tokendata.io/analytics](http://tokendata.io/analytics)
- [bsafe.network](http://bsafe.network)

## Appendix

BSafe.Network  
DLT Education  
United Nations

## BSafe University Research Network

**BSafe.network: Plays the Same Role as NSFNet and BSD**

- A **neutral, stable** and **sustainable** research test network for Blockchain technology by international universities.
- Founded by me and Pindar Wong in March 2016. Each university becomes a blockchain node.
- Research on Blockchain and its applications
  - Not limited to Security. All aspects will be researched.



- Neutral platform
- de-anchored trust of Blockchain network
- More nodes (with Neutrality)
- Testbed for academic research

Building Neutral Research Network by Academia: BSafe.network  
Shinichi Matsuo BSafe.network

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Cryptocurrency Bootcamp for Scholars at MIT Media Lab - August 2016



Japan Liberal Democratic Party HQ - Payments & IT Strategy Ministers



Standard Chartered Bank Singapore - Developer & Business Trainings

## EUIPO: European Union Intellectual Property Office

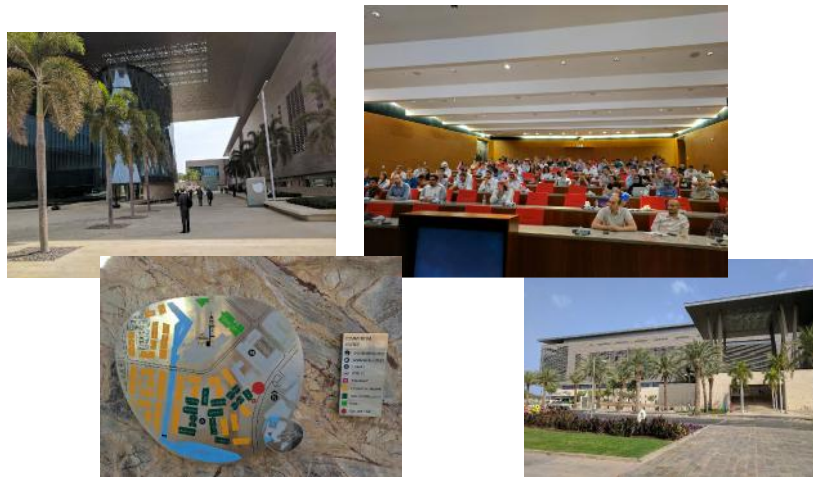


## Saudi Telecom Company

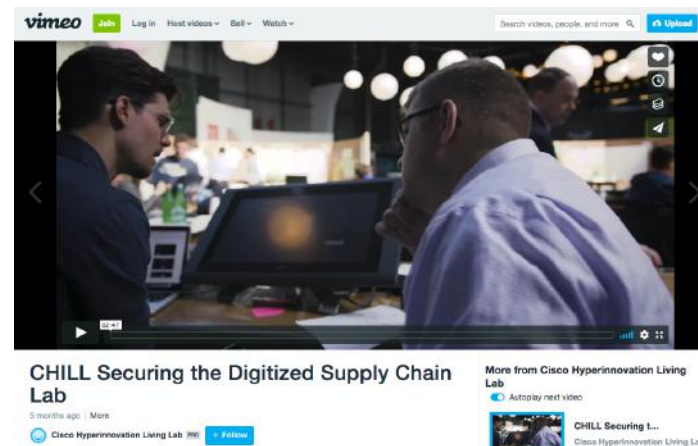




## KAUST: King Abdulla University of Science & Technology



## CHILL Securing the Digitized Supply Chain Lab \*powered by Blockchain



<https://vimeo.com/217181098>

### Meet the instructors



**Robert Schwenker**  
President of DLT.Education



**Alexandra Groetsema**  
Developer & Project  
Manager at DLT.Education



**Arianna Groetsema**  
Developer at DLT.Education



**Navroop Sahdev**  
FinTech and Blockchain  
Entrepreneur



**Nathalie Salami**  
Blockchain Attorney -  
Fintech Portfolio

Homework

<https://www.edx.org/course/blockchain-business-introduction-linuxfoundationx-lfs171x>



United Nations Entity for Gender Equality  
and the Empowerment of Women

### Blockchain Lab to test DLT solutions for Women refugees

The United Nations Entity for Gender Equality and the Empowerment of Women (UN Women) invites interested companies to express their interest for **Blockchain Live Test and Simulation**- reference number: RFQ/ UNWOMEN/2017/00065 (link:<http://www.unwomen.org/en/about-us/procurement> or <https://www.ungm.org/Public/Notice/63281>). You are invited to participate in this Request for Express of Interest (EOI).

## UN Women in Oslo with Innovation Norway & Startups



## Attorneys in the DLT space including:

Carol Van Cleef - BakerHostetler

Judith Rinearson - K&L Gates

Stephanie Sharron - Morrison & Foerster

Veronica McGregor - Goodwin Procter

Wanji Walcott & Genessa Stout - PayPal

Amor Saxton - Citigroup

Nathalie Salami - Blockchain startup founder,  
Hyperledger online course author

Primavera De Filippi - Harvard Research Fellow

Pamela Morgan - Third Key Solutions

Susan Joseph - One World Identity

Katheryn Haun - Coinbase board

Marco Santori - Cooley LLP

Bruce Cahan - Stanford

Mark Radcliffe - DLA Piper

Lance Koonce - DWT

Houman Shadab - NYLS

James Hazard - CommonAccord

