BITCOIN TO BLOCKCHAIN: FROM CYPHERPUNKS TO JP MORGAN CHASE

Brian Ho
Gillian Chu

LECTURE OVERVIEW

1. PRE BITCOIN
2. EARLY BITCOIN: SCANDALS, HACKS, ILLEGAL ACTIVITY
3. SCALABILITY DEBATES AND ETHEREUM
4. ENTERPRISE BLOCKCHAIN
5. TOKENS OF TODAY

1 PRE BITCOIN: LIBERTARIAN DREAMS

LIBERTARIAN DREAMS

CYPHERPUNKS AND CRYPTO-ANARCHISTS

"Privacy is necessary for an open society in the electronic age. Privacy is not secrecy. A private matter is something one doesn't want the whole world to know, but a secret matter is something one doesn't want anybody to know. Privacy is the power to selectively reveal oneself to the world"
(A Cypherpunk's Manifesto).

https://www.activism.net/cypherpunk/manifesto.html

LIBERTARIAN DREAMS

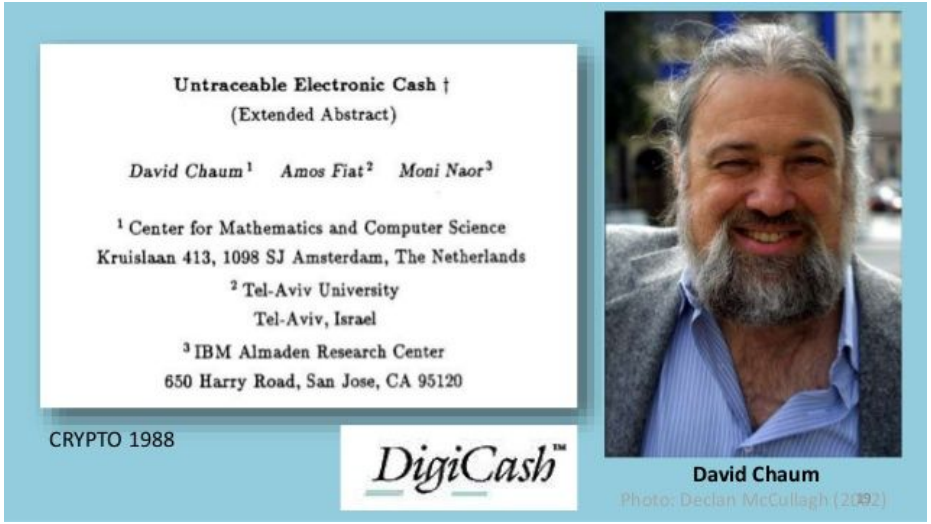
CYPHERPUNKS AND CRYPTO-ANARCHISTS

- **Cypherpunks and Crypto-anarchists**: libertarian groups concerned with privacy, and advocated cryptography as an important tool
- *"**Privacy** is the power to selectively reveal oneself to the world."*
- *"**Privacy** in an open society requires anonymous transaction systems"*

EARLY ATTEMPTS AT CRYPTOCURRENCY

DIGICASH, HASHCASH, B-MONEY

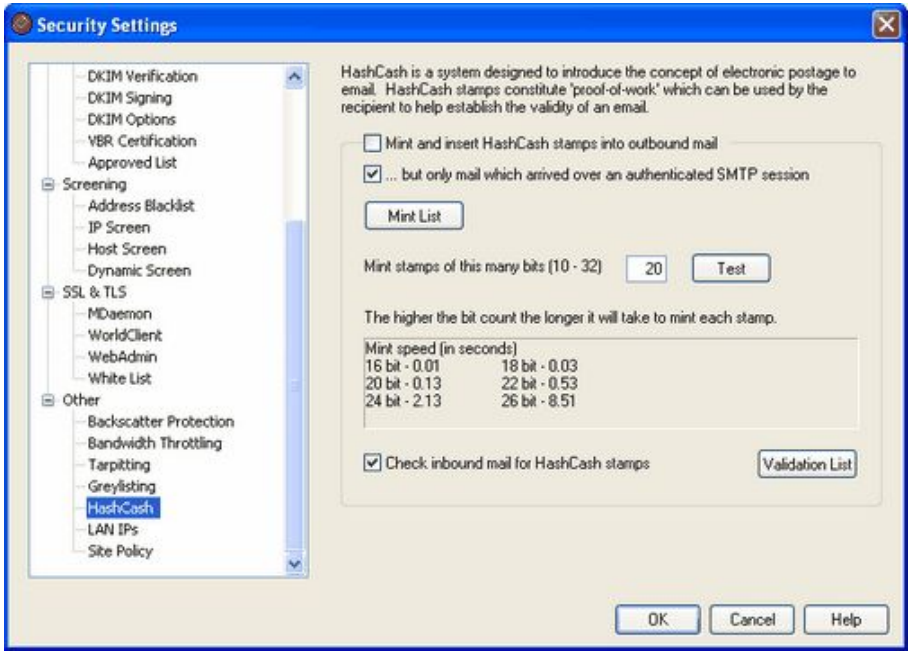
- **DigiCash**: "Blind signatures" public key cryptography
  - Allowed users to sign off on transactions without revealing anything about their identity
  - Failed due to centralization



EARLY ATTEMPTS AT CRYPTOCURRENCY

DIGICASH, HASHCASH, B-MONEY

- **HashCash:** Coins are minted by expending resources instead of by a central bank
  - Solve puzzle using a cryptographic hash function
  - Originally designed as a mechanism to limit email spam



EARLY ATTEMPTS AT CRYPTOCURRENCY

DIGICASH, HASHCASH, B-MONEY

- **B-MONEY**: Introduced two protocols
  - Practical way to enforce contractual agreements between anonymous actors
  - Protocol in which every participant maintains an individual database of how much money belongs to each user

SATOSHI NAKAMOTO

OCTOBER 2008: BITCOIN WHITEPAPER

- **Satoshi Nakamoto:** anonymous creator of Bitcoin, wrote the white paper
- Do we need trust? “electronic payment system based on cryptographic proof instead of trust”
- Solution to distributed consensus: Proof-of-Work, “one-CPU-one-vote”

BITCOIN: THE FIRST CRYPTOCURRENCY

GENESIS BLOCK MINED JAN 3, 2009

- Coinbase of the genesis block references a story in *Times of London* involving the Chancellor bailing out banks - Bitcoin's libertarian roots
- First bitcoin transaction on Jan 12, 2009 with Hal Finney

Block 0

Short link: http://blockexplorer.com/b/0

Hash: 000000000019d6689c085ae165831e934ff763ae46a2a6c172b3f1b60a8ce26f

Next block: 00000000839a8e6886ab5951d76f411475428afc90947ee320161bbf18eb6048

Time: 2009-01-03 18:15:05

Difficulty: 1 ("Bits": 1d00ffff)

Transactions: 1

Total BTC: 50

Size: 285 bytes

Merkle root: 4a5e1e4baab89f3a32518a88c31bc87f618f76673e2cc77ab2127b7afdeda33b

Nonce: 2083236893

Raw block

Transactions

Transaction	Fee	Size (kB)	From (amount)	To (amount)
4a5e1e4baa...	0	0.204	Generation: 50 + 0 total fees	1A1zP1eP5QGefi2DMPTfTL5SLmv7DivfNa: 50

BITCOIN GAINS VALUE

87 MILLION DOLLAR PIZZA BOUGHT MAY 2010

Author	Topic: Pizza for bitcoins? (Read 774776 times)
laszlo Full Member Activity: 199 Merit: 149	**Pizza for bitcoins?** May 18, 2010, 12:35:20 AM *Merited by alani123 (12), OgNasty (10), d5000 (5), EFS (1), vapourminer (1), iluvbitcoins (1), jacktheking (1), LoyceV (1), coolcoinz (1), Kda2018 (1), TheQuin (1), Toxic2040 (1), Toughit (1), nullius (1), alia_armelle (1)* #1 I'll pay 10,000 bitcoins for a couple of pizzas.. like maybe 2 large ones so I have some left over for the next day. I like having left over pizza to nibble on later. You can make the pizza yourself and bring it to my house or order it for me from a delivery place, but what I'm aiming for is getting food delivered in exchange for bitcoins where I don't have to order or prepare it myself, kind of like ordering a 'breakfast platter' at a hotel or something, they just bring you something to eat and you're happy! I like things like onions, peppers, sausage, mushrooms, tomatoes, pepperoni, etc.. just standard stuff no weird fish topping or anything like that. I also like regular cheese pizzas which may be cheaper to prepare or otherwise acquire. If you're interested please let me know and we can work out a deal. Thanks, Laszlo BC: 157fRrqAKrDyGHr1Bx3yDxeMv8Rh45aUet

https://bitcointalk.org/index.php?topic=137.0

BITCOIN GAINS VALUE

87 MILLION DOLLAR PIZZA BOUGHT MAY 2010

- May 22, 2010, **Laszlo Hanyecz** purchased $25 worth of pizza for 10,000 BTC
- Fun fact: 10,000 BTC is now equivalent to ~$87,000,000
- World's first ever Bitcoin transaction for a tangible asset
- Bitcoin went from worthless internet money to something with real value

BITCOIN GAINS VALUE

87 MILLION DOLLAR PIZZA BOUGHT MAY 2010

5184x3456 (1/60) f/5.6 f(35)=78mm (flash)
2010-05-22 15:01:08 -0400

Download: IMG_0984.jpg

5184x3456 (1/60) f/5.6 f(35)=78mm (flash)
2010-05-22 15:01:22 -0400

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5184x3456 (1/60) f/5.6 f(35)=78mm (flash)
2010-05-22 15:01:29 -0400

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5184x3456 (1/60) f/5.6 f(35)=78mm (flash)
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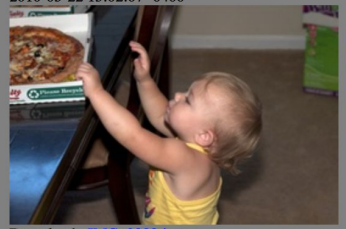


Download: IMG_0989.jpg

Re: Pizza for bitcoins?
May 22, 2010, 07:17:26 PM

I just want to report that I successfully traded 10,000 bitcoins for pizza.

Pictures: http://heliacal.net/~solar/bitcoin/pizza/

Thanks jercos!

QUESTIONS?

2

EARLY BITCOIN: SCANDALS, HACKS, ILLEGAL ACTIVITY

BITCOIN THEFT

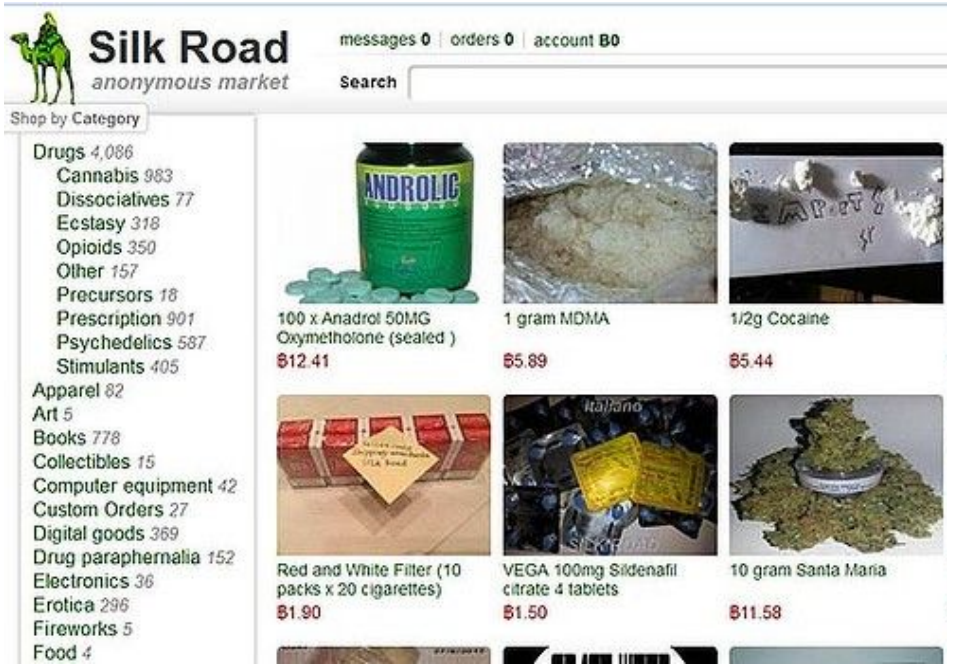
MT. GOX JULY 2010 - FEB 2014

- 2010: **Jed McCaleb** creates Mt. Gox, the biggest online bitcoin exchange
- 2011: Mt. Gox suffers a significant breach of security that resulted in fraudulent trading
- 2014: Mt. Gox is handling 70% of transactions
- 2014: Mt. Gox loses 744,408 bitcoins in a theft that went unnoticed for years; Mt. Gox declares bankruptcy

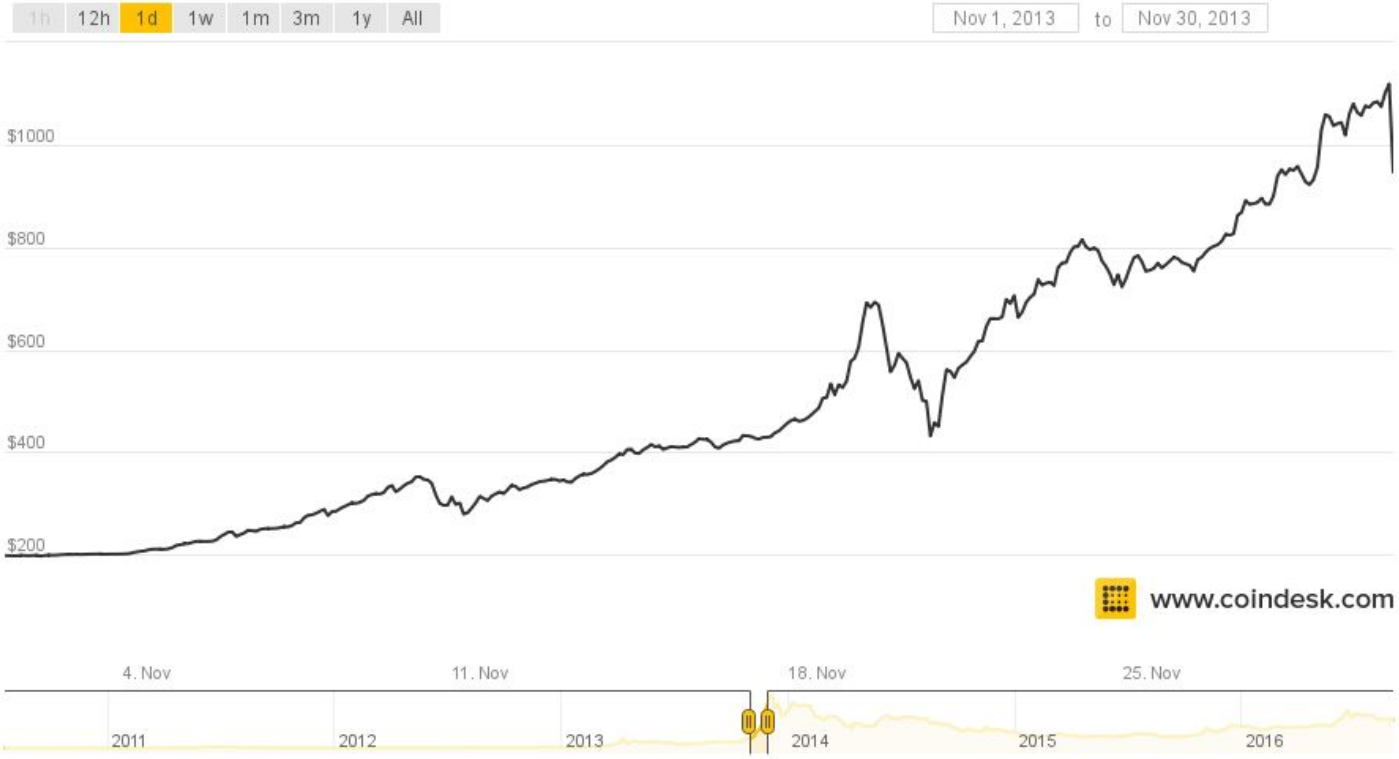
BITCOIN DRUG SCANDAL

SILK ROAD FEB 2011 - OCT 2013

- Feb 2011: **Silk Road** opens as the anonymous “eBay of Drugs”, using Tor and Bitcoin
- Drugs and black market goods become the use case for Bitcoin
- Oct 2013: the FBI shut down Silk Road, seizing $3.5m in bitcoin
- **Ross Ulbricht** “Dread Pirate Roberts” is serving a life sentence



BITCOIN BUBBLE



EXPLOSION OF ALTCOINS

Litecoin

ZCash

Stellar

Peercoin

Dogecoin

DASH

Monero

Ripple

BITCOIN HEADLINES

POPULARITY GROWS, MERCHANT BEGIN TO ACCEPT BITCOIN

2014 Headlines

- February 2014: Mt. Gox Allegedly Loses $350 Million in Bitcoin (744,400 BTC)
- March 2014: Bitcoin Inventor Satoshi Nakamoto 'Found' in California
- 2014 Sep. Tim Draper: Bitcoin's Price Still Headed to $10k

Merchant Acceptance

- 2014 Jan. Porn.com accepts Bitcoin
- 2014 Jan. Overstock.com Becomes First Major Retailer to Accept Bitcoins
- 2014 Apr. New Colorado Marijuana Vending Machines Will Accept Bitcoin
- 2014 Sep. PayPal partners with and Coinbase, BitPay
- (2014 Oct.) "Whoever said that bitcoin couldn't buy you things? ... Shitexpress is a service that mails a tupperware container of horse manure with a personalised message on your behalf." - CoinDesk

BITCOIN STARTUPS

coinbase

xapo

ANDREESSEN HOROWITZ

COINALYTICS

BitGo™

BLOCKCHAIN

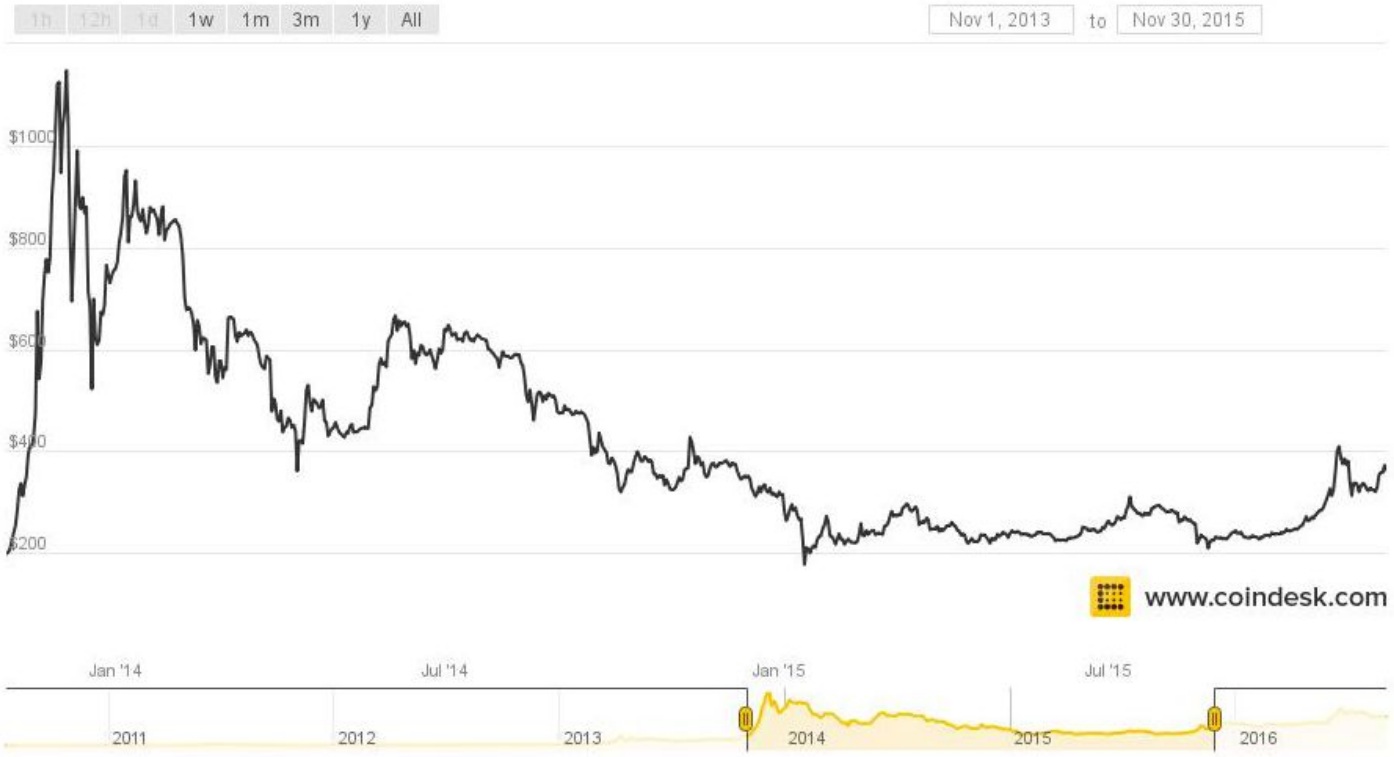
Chain

PANTERA

BLOCKCHAIN CAPITAL

CIRCLE

… AND BURST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12h
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1m
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All
Nov 1, 2013
to
Nov 30, 2015
$1000
$800
$600
$400
$200
www.coindesk.com
Jan '14
Jul '14
Jan '15
Jul '15
2011
2012
2013
2014
2015
2016

QUESTIONS?


BREAK
SECTION
BLOCKCHAIN
AT BERKELEY

3 SCALABILITY DEBATES & ETHEREUM

BITCOIN STRUGGLES TO SCALE

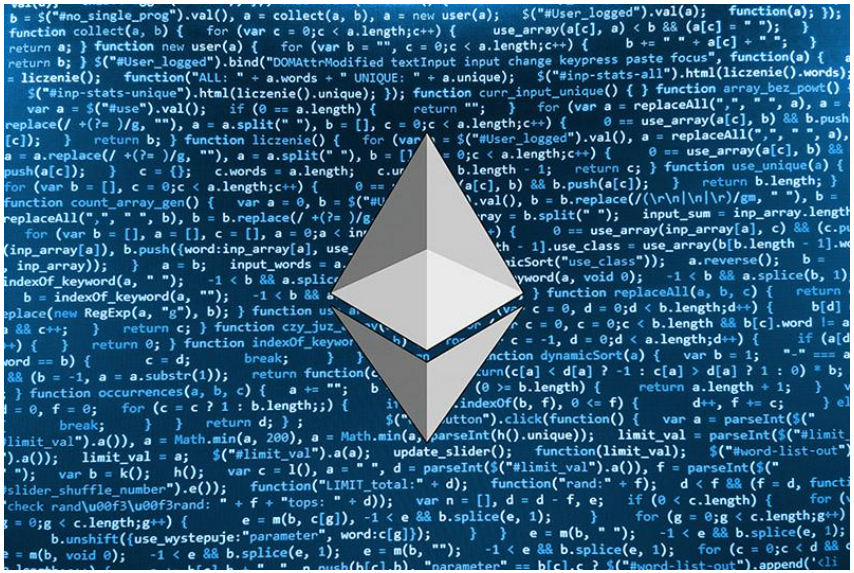
BLOCK SIZE DEBATE 2015

- Bitcoin blocks are created every 10 minutes and can only hold 1 MB of transactions
- 2015: blocks begin to run out of space, transactions go unconfirmed
- **Block Size Debate** raises questions about decentralized governance

2013 - 2016: ETHEREUM TIMELINE

Bitcoin is “coin centric.”
Primary Purpose: Alternative to existing currency

Ethereum is a Turing-complete protocol that uses its coin ether as “fuel”.
Primary Purpose: Platform for decentralized applications + Smart Contracts

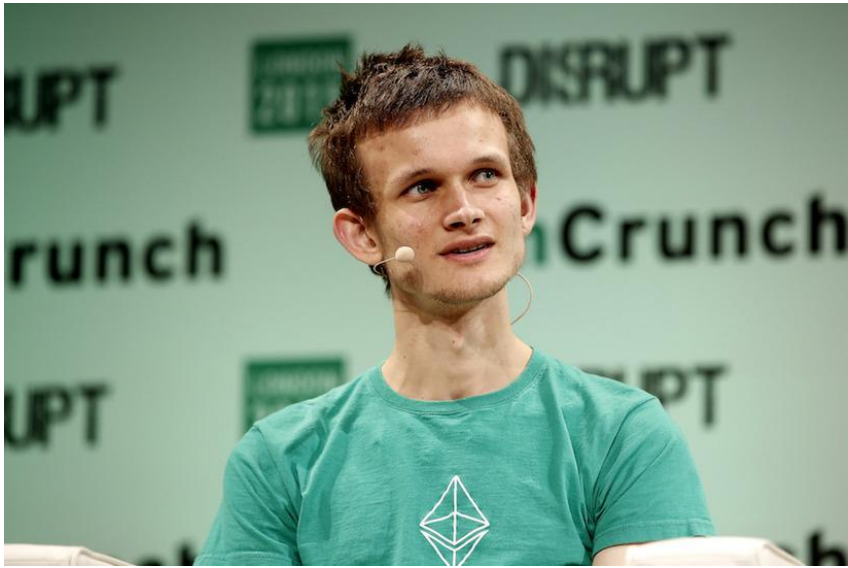


2013 - 2016: ETHEREUM TIMELINE

ETHEREUM BLOWS UP IN MULTIPLE WAYS

History

- Late 2013: Ethereum described in whitepaper by Vitalik Buterin
- July and August 2014: Ethereum crowdsale
- July 30th 2015: Ethereum blockchain launched
- May 2016: Value of Ethereum tokens worth more than $1 billion
- July 2016: TheDAO rise and hack



2016 - PRESENT: ETHEREUM BUBBLE

Regulatory Circumstances:

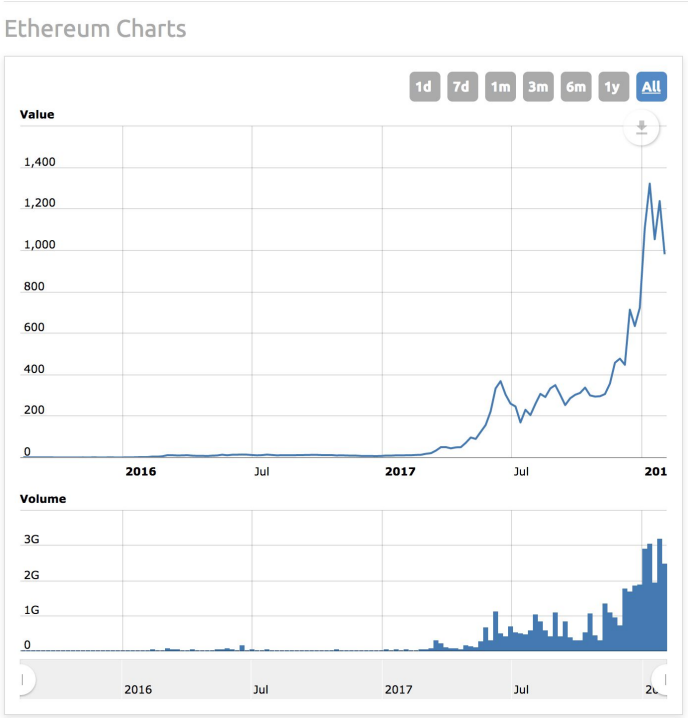
- Speculation about how the Securities and Exchange Commision would rule on the DAO fiasco, reversal of tokens values

Economic Circumstances:

- Exchange Traded Funds ruling
- ICOs (Initial Coin Offerings)
- Venture Capital funding for crypto companies

Other factors:

- People don't want to miss out on the "next bitcoin"



2016 - 2017: HYPE TRAIN

Economic Circumstances:

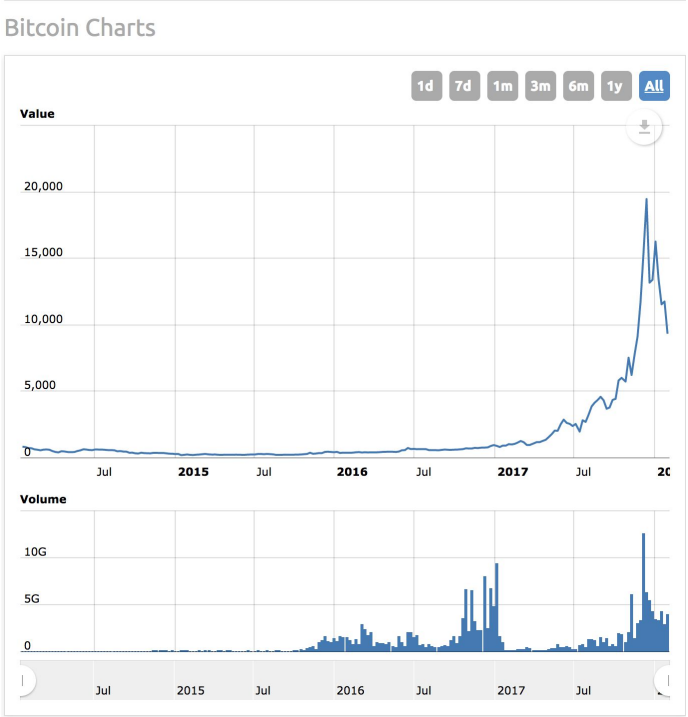
- Ethereum bounces back
- General Instability in the market

Political Circumstances:

- Brexit
- Trump
- India's War on Cash

Bitcoin & Cryptocurrency Hype

- Bitcoin prices get broadcast on the radio now



2016 - 2017: HYPE TRAIN

2016 - 2017: HYPE TRAIN

Mining on Soda servers Inbox x

[redacted] 9/20/11

to me

Hi,

We've been noticing some unusual traffic coming in and out of the computers at Soda under your account, and we have evidence to believe you've setup a Bitcoin mining network using university resources. If this is the case, we'd like to ask you to stop as your activity has been degrading the experience for other students who use the computers for actual assignments and labs. We hope you understand.

Thanks,
[redacted]

[redacted] 4:18 PM (6 minutes ago)

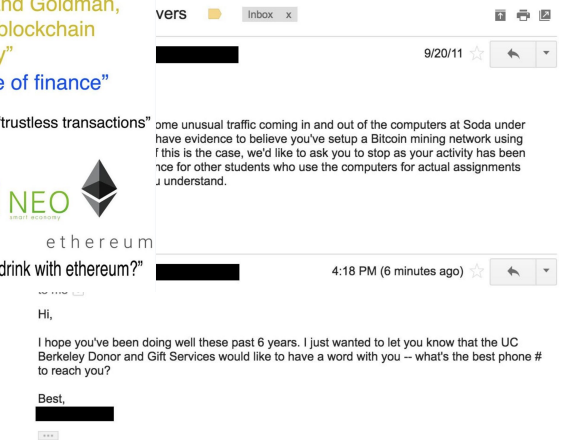
to me

Hi,

I hope you've been doing well these past 6 years. I just wanted to let you know that the UC Berkeley Donor and Gift Services would like to have a word with you -- what's the best phone # to reach you?

Best,
[redacted]

2016 - 2017: HYPE TRAIN



QUESTIONS?

2017- PRESENT: GET OFF AT THIS STATION

WHY THE CRASH?

2017- PRESENT: GET OFF AT THIS STATION

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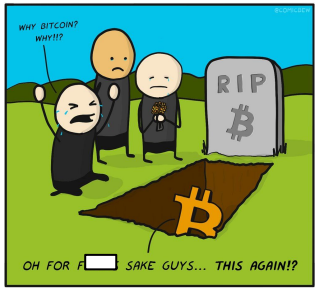


Regulation in South Korea
Regulation in India
Regulation in the UK
Regulation in the US
...

427

A lot of you forgot why we bought into btc in the first place (self.Bitcoin)

submitted 10 hours ago by obkenobi13 redditor for 3 months

Let's remind ourselves here why we bought btc in the first place: a censorship resistant and permissionless system where no fucking institution tells me with whom I am allowed to transact with. This is an investment that bets against a repressive system built and maintained by corrupt governments and corporations that serve their own needs. If you still haven't grasped this then please sell all your coins and GTFO.

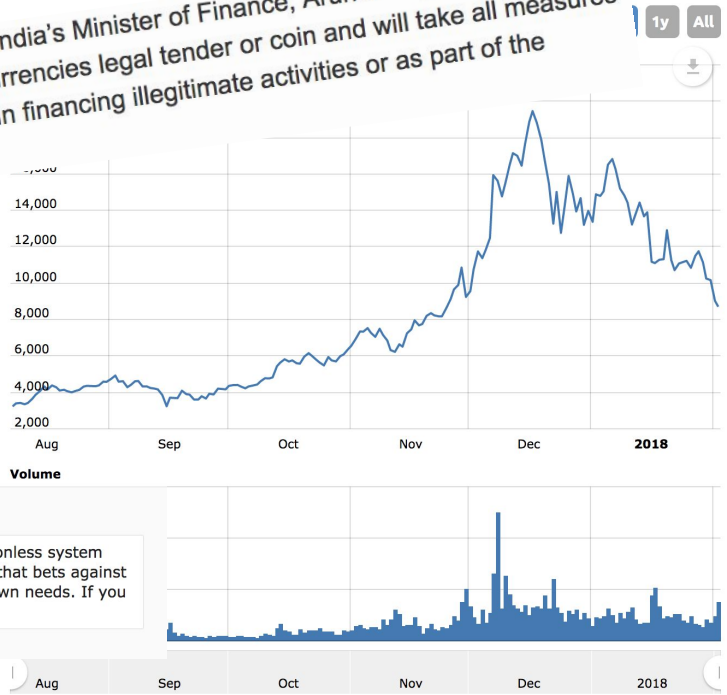
253 comments share save hide give gold report crosspost

2017- PRESENT: GET OFF AT THIS STATION

WHY THE CRASH?

Regulati
Regulatic
Regulation in the UK
Regulation in the US
...

"The drop followed comments made by India's Minister of Finance, Arun Jaitley, that the Indian government 'does not consider cryptocurrencies legal tender or coin and will take all measures to eliminate use of these crypto-assets in financing illegitimate activities or as part of the payment system'.



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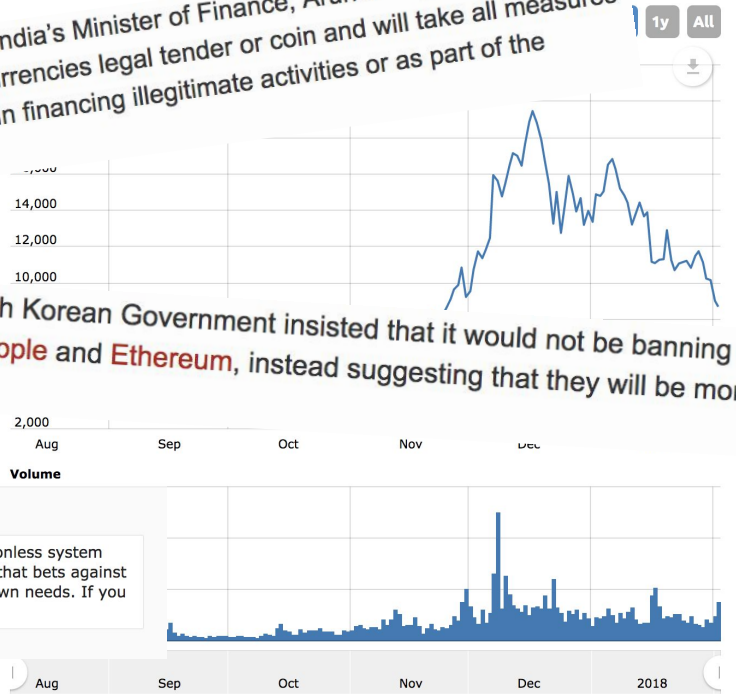
"The drop followed comments made by India's Minister of Finance, Arun Jaitley, that the Indian government 'does not consider cryptocurrencies legal tender or coin and will take all measures to eliminate use of these crypto-assets in financing illegitimate activities or as part of the payment system'.

The news comes after the South Korean Government insisted that it would not be banning cryptocurrencies like bitcoin, Ripple and Ethereum, instead suggesting that they will be more heavily regulated.



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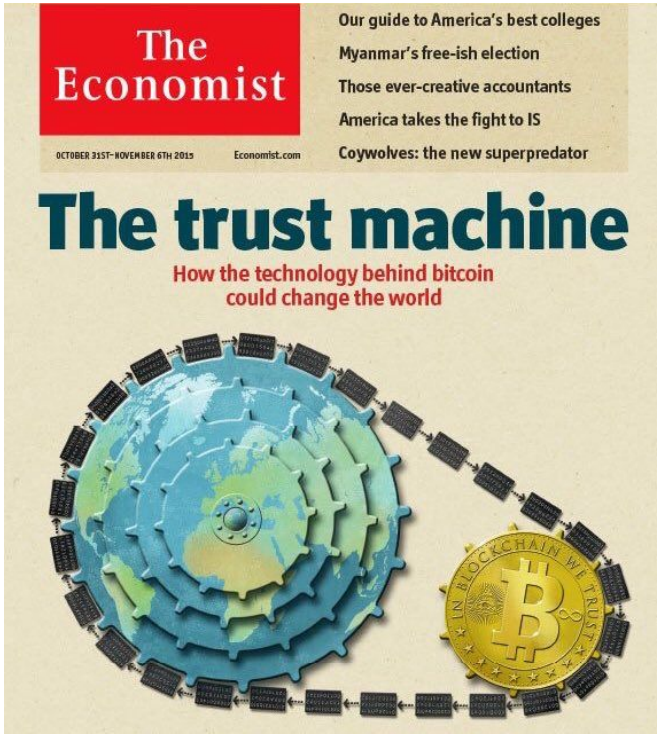
253 comments share save hide give gold report crosspost

4 ENTERPRISE BLOCKCHAIN

4.1 INTEREST IN BLOCKCHAIN FROM BANKS

BANKS & BLOCKCHAIN

- Rise of interest in "private blockchains" or "permissioned ledgers."
  - Not open
  - Not trustless
  - No economic incentives like in Bitcoin
  - Separate "blockchain" from "Bitcoin"
- Con:
  - Glorified public key cryptography
- Benefit:
  - More compliant



PRIVATE BLOCKCHAIN INITIATIVES

Chain

R3

Digital Asset

HYPERLEDGER PROJECT

J.P.Morgan

IBM

DIMON QUOTES ON BITCOIN/BLOCKCHAIN

Jan 2014: "It's a terrible store of value. It could be replicated over and over."

People still don't understand Bitcoin

"It's a terrible store of value." CNBC

http://www.businessinsider.com/jp-morgans-jamie-dimon-on-bitcoin-2014-1

DIMON QUOTES ON BITCOIN/BLOCKCHAIN

Oct 2014: "[Bitcoin developers] are going to try and eat our lunch. And that's fine. That's called competition, and we'll be competing."

Conceding legitimacy to Bitcoin

http://static6.businessinsider.com/image/5527c91969beddfd15404336-480/jp-morgan-chase-and-company-ceo-jamie-dimon.jpg

DIMON QUOTES ON BITCOIN/BLOCKCHAIN

Nov 2015: “Virtual currency, where it’s called a bitcoin vs. a U.S. dollar, that’s going to be stopped. … No government will ever support a virtual currency that goes around borders and doesn’t have the same controls. It’s not going to happen.”

Bankers hate the lack of control. Perhaps threatened?

http://fortune.com/2015/11/04/jamie-dimon-virtual-currency-bitcoin/

DIMON QUOTES ON BITCOIN/BLOCKCHAIN

Oct 2017: “Bitcoin is a “fraud” that won’t end well. If you’re stupid enough to buy [bitcoin], you’ll pay the price for it one day. The blockchain is a technology which is a good technology. We actually use it... God bless the blockchain."

DIMON QUOTES ON BITCOIN/BLOCKCHAIN

Oct 20
end we
[bitcoin], you'll pay the price for it one
day. The blockchain is a technology
which is a good technology. We act
use it... God bless the blockchain."

Aaron Lucchetti
@AaronLucchetti

Jamie Dimon on #bitcoin: I'd fire a JPM trader in a second who traded that. Its against the rules, its stupid, its dangerous.

9:48 AM - Sep 12, 2017

12 22 15

Jennifer Ablan
@jennablan

JAMIE DIMON: ONE OF MY DAUGHTERS BOUGHT BITCOIN AND IT WENT UP; 'SHE THINKS SHE IS A GENIUS' - CNBC CONFERENCE

11:39 AM - Sep 12, 2017

5 20 48

DIMON QUOTES ON BITCOIN/BLOCKCHAIN

January 2018: “The blockchain is real. You can have crypto yen and dollars and stuff like that... The bitcoin to me was always what the governments are gonna feel about bitcoin as it gets really big, and I just have a different opinion than other people."

Untraceable Electronic Cash †

(Extended Abstract)

David Chaum[1] *Amos Fiat*[2] *Moni Naor*[3]

[1] Center for Mathematics and Computer Science
Kruislaan 413, 1098 SJ Amsterdam, The Netherlands

[2] Tel-Aviv University
Tel-Aviv, Israel

[3] IBM Almaden Research Center
650 Harry Road, San Jose, CA 95120

CRYPTO 1988

DigiCash™

David Chaum

Photo: Declan McCullagh (2002)


JPMORGAN CHASE&Co

QUESTIONS?

COMMENTS

THE WILD WEST OF THE INTERNET

[–] **BufferUnderpants** [score hidden] 2 hours ago

The promise of money multiplying itself for no discernible reason?

[–] **Auwardamn** 2 points 4 months ago

Bitcoin needs to become a asset of equivalent value for all other comparable assets before it becomes a currency. Rapid price swings are indicative of it still reaching its true market value. Which imo is orders of magnitude higher than the current price.

Once bitcoin becomes comparable in valuation to that of precious metals, volatility will decrease substantially. The amount of coins held has effectively 0 long term effect other than how quickly we get to such a valuation.

permalink embed save parent report give gold reply

[–] **DankLard** redditor for 3 months 3 points 1 month ago

Today commentor on a TechCrunch article said Bitcoin was created by the Fed so they can steal your money when "the grid goes down"

permalink embed save report give gold reply

[–] **PopCultureNerd** [S] 2 points 1 month ago

I should email BitCoin and ask to see if BitCoin is hiring.

permalink embed save report give gold reply

4.2 BITCOIN COMMUNITY & POLITICS

COMMUNITY

WHERE DOES THE COMMUNITY EXIST?

bitcointalk.org

slack

BLOCKCHAIN AT BERKELEY

POLITICS

- Internal politics
- Right-wing extremism?
- Libertarianism

GEMINI coinx ChainPay
bitpay coinbase SNAPCARD
trucoin bitsquare Coinkite

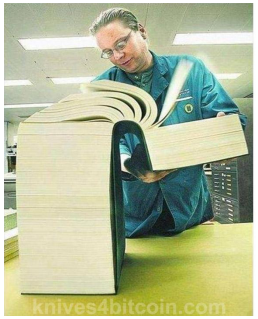
BITMAIN ANTMINER BTCChina BitFury

CONTROVERSIAL TOPICS

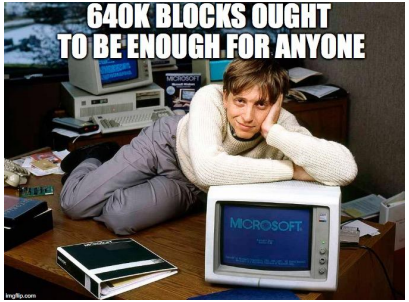
In the US government, we try to best represent all of our citizens' best interests and opinions.

In the blockchain community, we have different ways to come to consensus about changes that happen. We have the most trouble agreeing on:

- Block Size? (What is Segwit2x)?
- Confirmation Times?
- Centralization in third party companies?



The Bitcoin block size debate is now available in this convenient paperback



QUESTIONS?

5 TOKENS OF TODAY

ICOs
THE HYPE

ICOs - Initial Coin Offerings

- Way for people to invest Ether into startups of companies being built on top of Ethereum
- Permissionless, effortless way to invest in a good company (think Kickstarter)
- VCs trending worried

Bancor ICO $150million
Tezos ICO $200 million
Filecoin ICO $253 Million

Filecoin

Bancor

ICOs

DOING WHAT YOU WANT

EXPLOSION OF ALTCOINS

Litecoin

ZCash

Stellar

Peercoin

Dogecoin

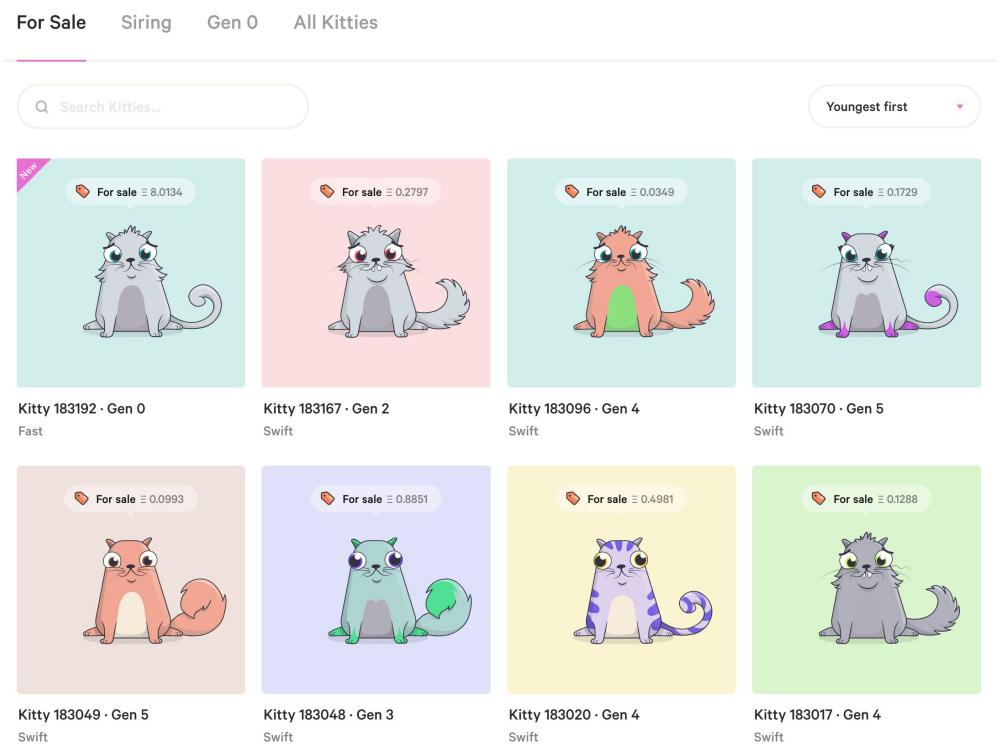
DASH

Monero

Ripple

CRYPTOKITTIES

THE HYPE



QUESTIONS?

HOMEWORK/READINGS

All this information will be made available at blockchain.berkeley.edu/decal, through email, and on Piazza.

Required Readings:

1. A Cypherpunk's Manifesto by Eric Hughes
   - https://www.activism.net/cypherpunk/manifesto.html
2. Coindesk: A Bot Named Willy: Did Mt. Gox's Automated Trading Pump Bitcoin's Price?
   - https://www.coindesk.com/bot-named-willy-did-mt-goxs-automated-trading-pump-bitcoin-price
3. The DAO, The Hack, The Soft Fork and The Hard Fork
   - https://www.cryptocompare.com/coins/guides/the-dao-the-hack-the-soft-fork-and-the-hard-fork/

Extra Readings:

- (to get ahead) Princeton Textbook 1.1 Cryptographic Hash Functions (pages 23-31)
- All You Need to Know About ICOs
- Digital Gold by Nathaniel Popper

REFERENCES

- Venture funding
  - http://www.coindesk.com/bitcoin-venture-capital/
  - https://letstalkpayments.com/high-profile-investments-bitcoin-2013/
  - http://www.coindesk.com/venture-capital-funding-bitcoin-startups-triples-2014/
- News:
  - http://www.coindesk.com/6-weird-wonderful-bitcoin-events-2014/
  - http://www.coindesk.com/7-biggest-crypto-scandals-2014/
  - http://www.coindesk.com/year-headlines-coindesks-top-news-stories-2014/