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How Technology Changes Everything and Changes Nothing: The Blockchain Example

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On the Agenda

Technology Impact

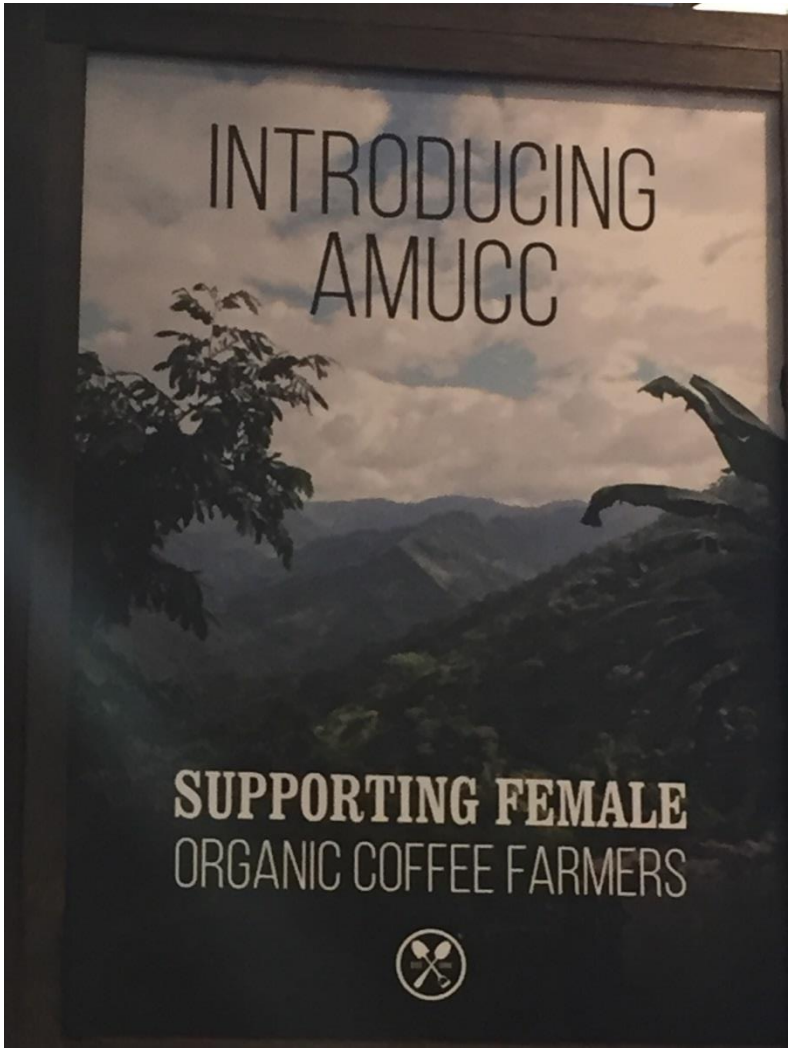
The Internet

Blockchain

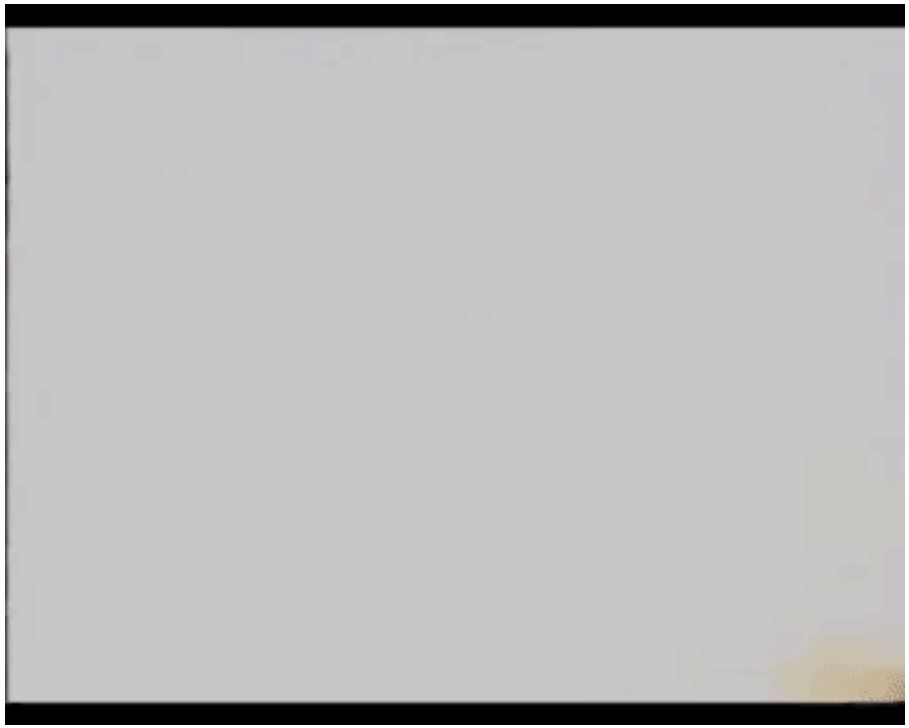
- ***What is it***
- ***How does it work***
- ***How can it be used***
- ***How will it change my business***
- ***How to invest***

My background

Los Angeles => Portland



Haifa, Israel January 1991



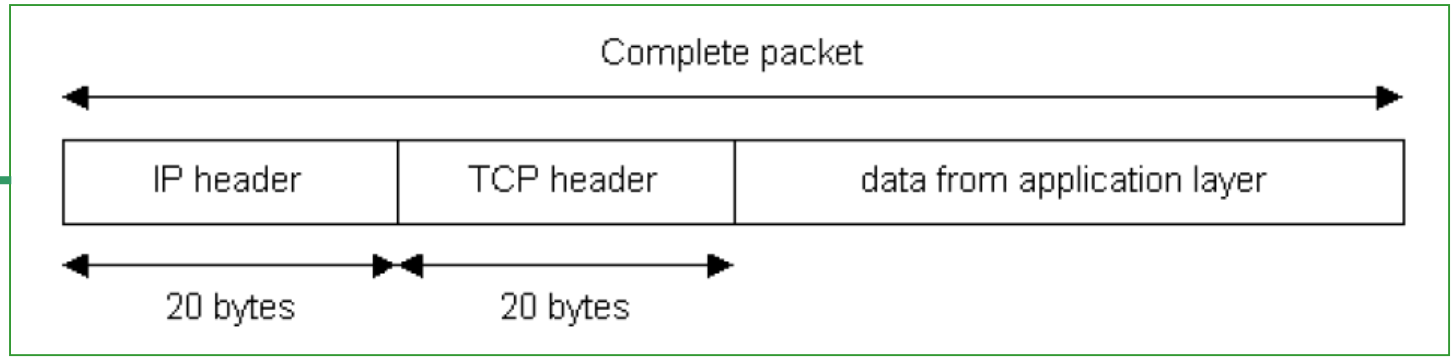
The Internet Early 1990's…

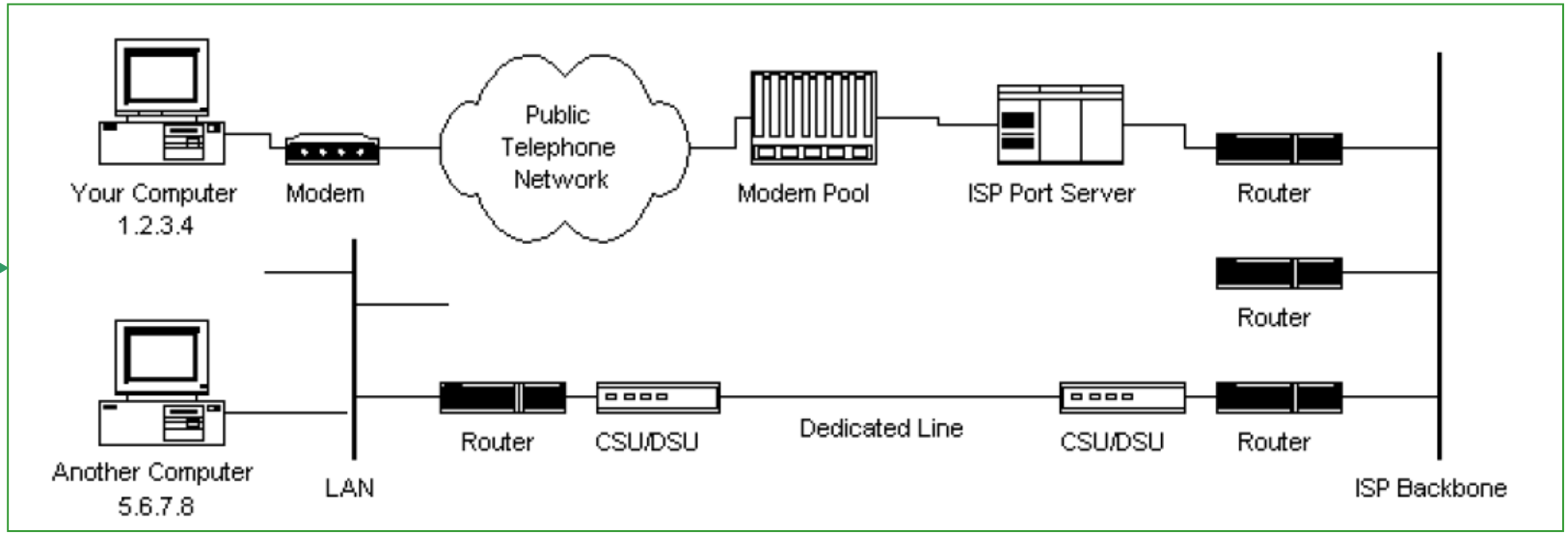
"*Just for idle chat and hate speech*"

snapchat

Internet

- “Packet” travel using TCP/IP protocols
- Not unique, can be copied in unlimited supply





Explaining Blockchain

Intellectually:

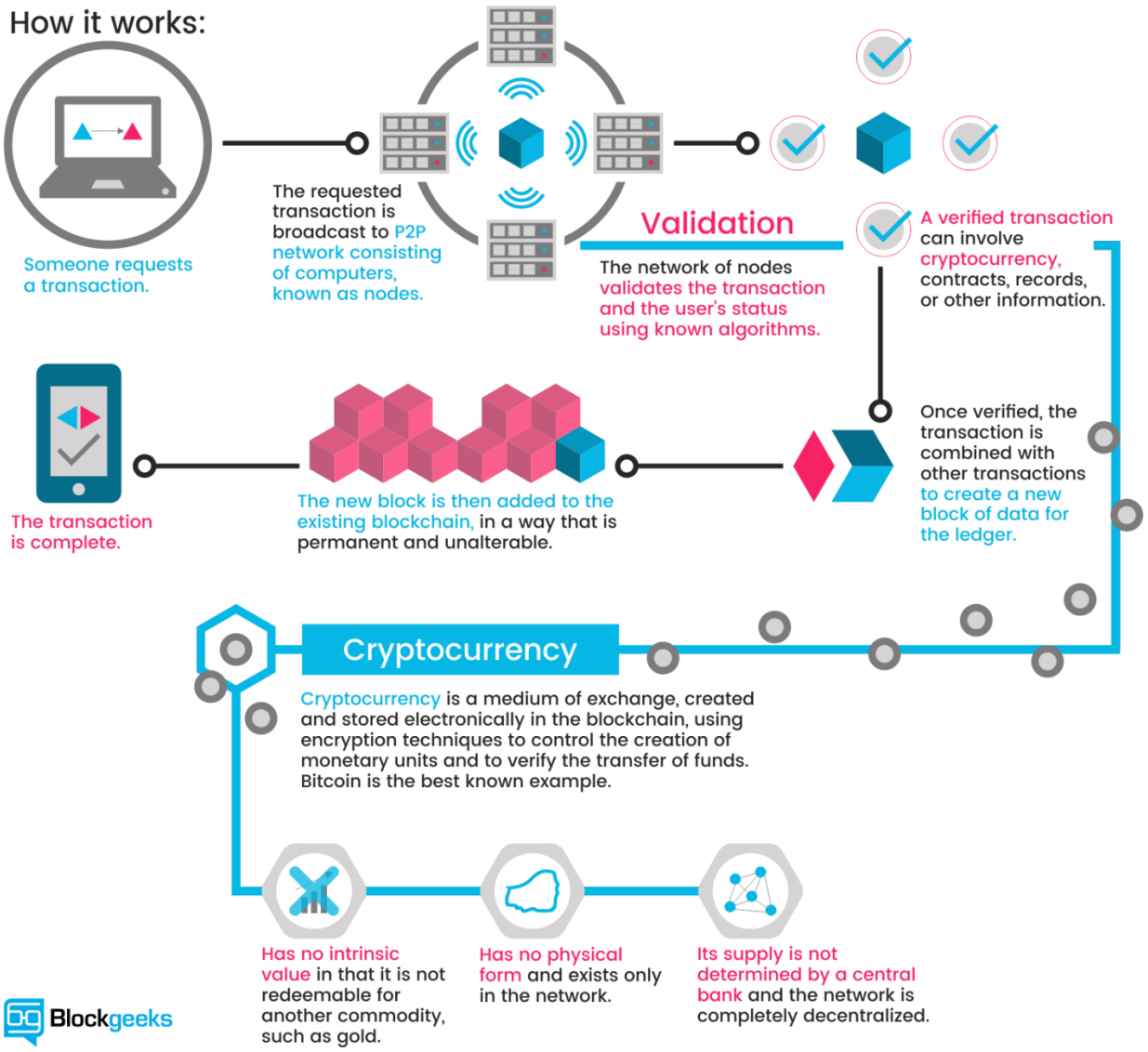
- One **distributed ledger** everybody *trusts*
- Record of **ownership** going all the way to initial state
- **Peer-to-Peer** - no 3rd party/network/exchange
- Secured by cryptography and **tokens** containing value

What you need to know:

- Shared database with open *read* capabilities and limited *write* controlled by a consensus of participants

There is a Dilbert for Everything

How Does it Work - Basics of a Transaction



Source: Blockgeeks

Centralized vs. Peer-to-Peer

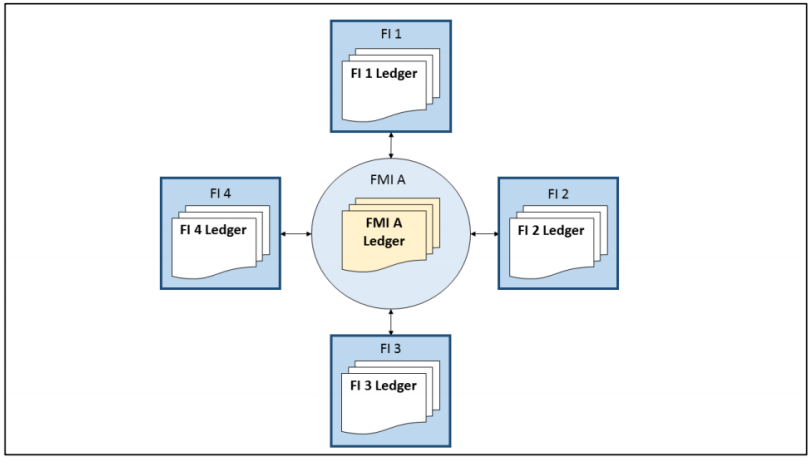


Figure 1: Simple example of a hub and spoke structure with one FMI and financial institutions (FIs) as participants

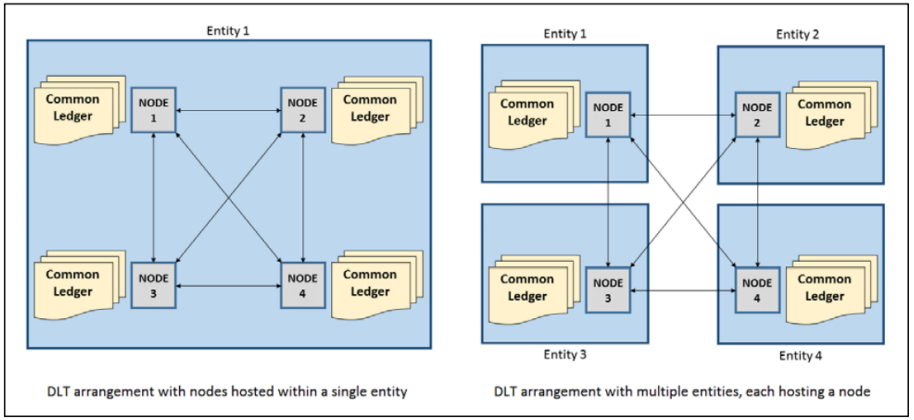


Figure 3: Two simple examples of node connectivity structure

Source: Federal Reserve

Using Powerful Encryption

Input	rohasnagpal@gmail.com:info@primechain.in:06112016:0
sha256 hash	2d87bf06373f4e91b43ab6180e30da0bf3f98efb44c5d5e2f7151b3179413bf6

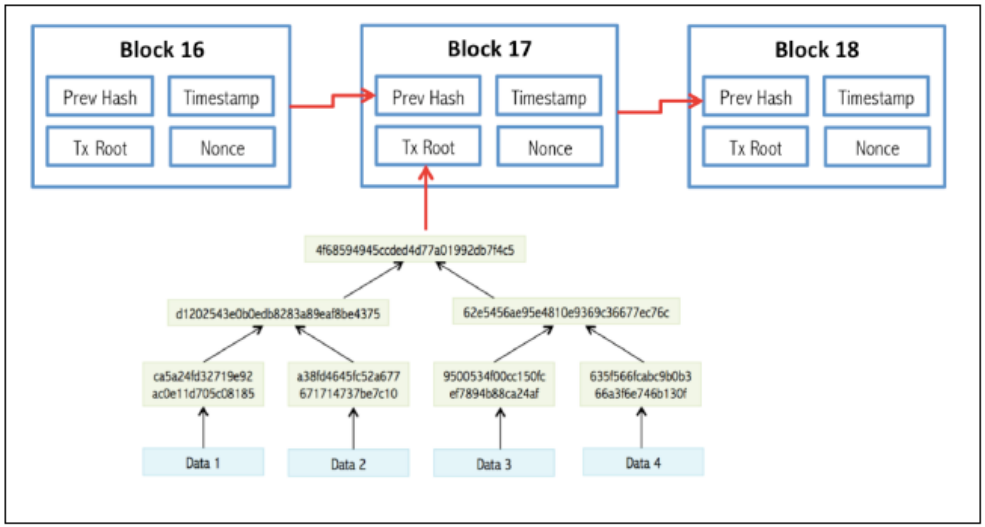
Input	rohasnagpal@gmail.com:info@primechain.in:06112016:1
sha256 hash	cb3616e4ab0cee86badf0a598d1a151e06289c2c7e35f91554dc1ad7d128a99d

Input	rohasnagpal@gmail.com:info@primechain.in:06112016:2
sha256 hash	8d04a9e7ccd2c84549744c7fdbd48e3784ea3ab10020499a89349875726e3536

And so on till .. 76063

Input	rohasnagpal@gmail.com:info@primechain.in:06112016:76063
sha256 hash	0000b3c73f0cd6a92158b713fbade5f898dffeefc0a615d050b1ea391bd39906

Source: Primechain Technologies Pvt. Ltd.

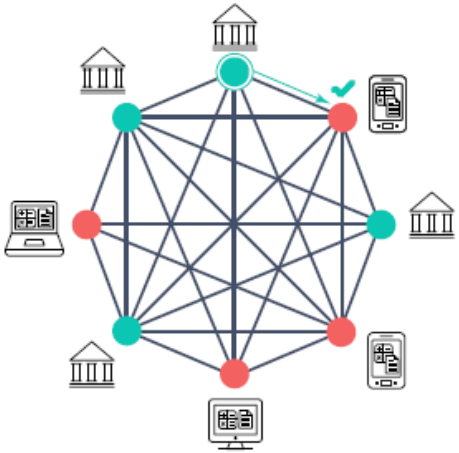


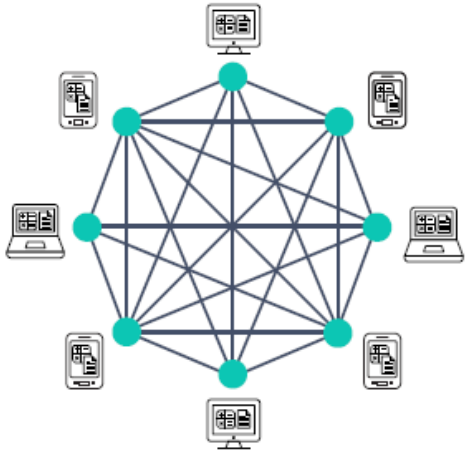
Source: Primechain Technologies Pvt. Ltd.

Private vs. Public Blockchain

Validator node
(Can both initiate/receive and validate transactions)

Member node
(Can only initiate/receive transactions)





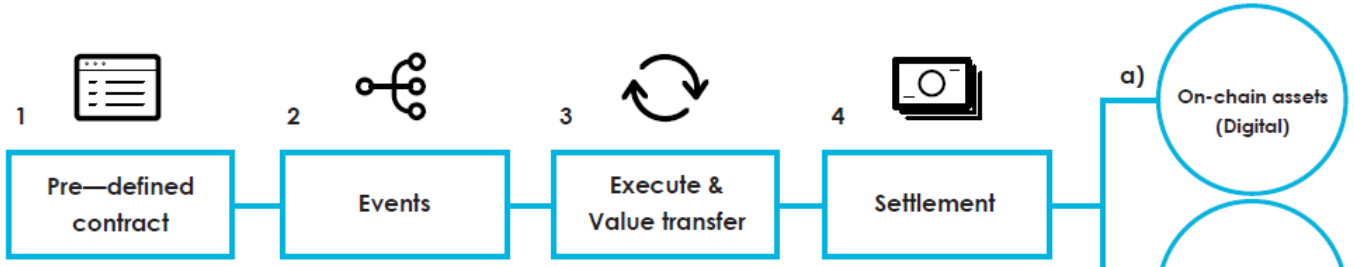
	Permissioned Blockchain (Private)	Permissionless Blockchain (public)
How do you get access to the network?	Authorized access	Open access
How are their approach to laws and regulations?	Aims to follow financial regulations such as AML/ KYC	Aims to create censorship resistant, anonymous transactions, outside current legal framework
Who are the validators?	Pre-selected, trusted validators	Anonymous, fully decentralized validators
What can it be used for?	Enterprise-level systems	Permissionless innovation, open-access applications

Source: EVRY

Use Cases

- Real estate
- Securities trading
- International payments and trade finance
- Remittance
- Micro payments
- Smart contracts
- ICOs – Initial Coin Offerings

Smart Contracts



- Terms are established by all counterparties, such as:
  - ◊ Variable interest rate (e.g LIBOR)
  - ◊ Currency of payments
  - ◊ Currency rate
- Conditions for execution (e.g time and date, LIBOR rate at given value)

- Event triggers contract execution
- Event can refer to:
  - ◊ Transaction initiated
  - ◊ Information received

- Terms of contract dictate movement of value based on conditions met.

a. For digital assets on the chain, such as a cryptocurrency, accounts are atomically settled

b. For assets represented off the chain, such as stocks and fiat, changes to accounts on the ledger will match off-chain settlement instructions

Source: EVRY

Everything Will Change

	2012	2012%
Gross domestic product	16,244,586	*100.0*
Agriculture, forestry, fishing, and hunting	201,138	*1.2*
Mining	429,656	*2.6*
Utilities	275,148	*1.7*
Construction	581,073	*3.6*
Manufacturing	2,034,333	*12.5*
Wholesale trade	962,694	*5.9*
Retail trade	927,849	*5.7*
Transportation and warehousing	471,637	*2.9*
Information	776,740	*4.8*
Finance, insurance, real estate, rental, and leasing	3,172,548	*19.5*
Professional and business services	1,937,240	*11.9*
Educational services, health care, and social assistance	1,339,698	*8.2*
Arts, entertainment, recreation, accommodation, and food services	596,547	*3.7*
Other services, except government	352,014	*2.2*
Government	2,186,268	*13.5*

Federal Reserve banks, credit intermediation, and related activities	435,033
Securities, commodity contracts, and investments	184,592
Insurance carriers and related activities	413,066
Funds, trusts, and other financial vehicles	45,463
Real estate	1,917,249
Rental and leasing services and lessors of intangible assets	177,146
Legal services	225,249
Sum of Trust-Based Service Sectors	3,397,798
As a percentage of GDP	21%

Nothing Will Change

- Almost all banks* are in the business of making loans and gathering deposits, with related fee-based business lines
  - Didn't go away with PC
  - Didn't go away with Internet
  - Won't go away with Blockchain
- Channels, tools and service providers change, not banking
- "Fintech disruptors" almost always end up building on existing banking network** – e.g. PayPal, Green Dot, Square

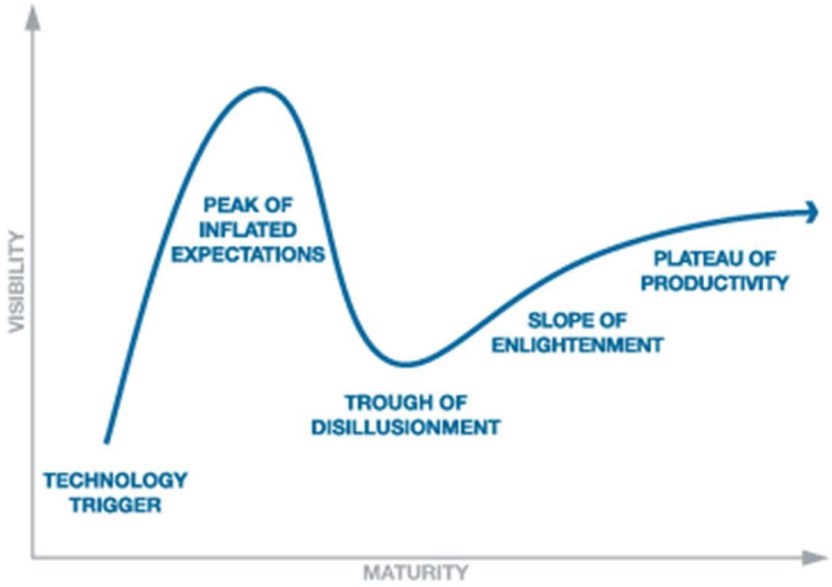
** Excl. money center banks*

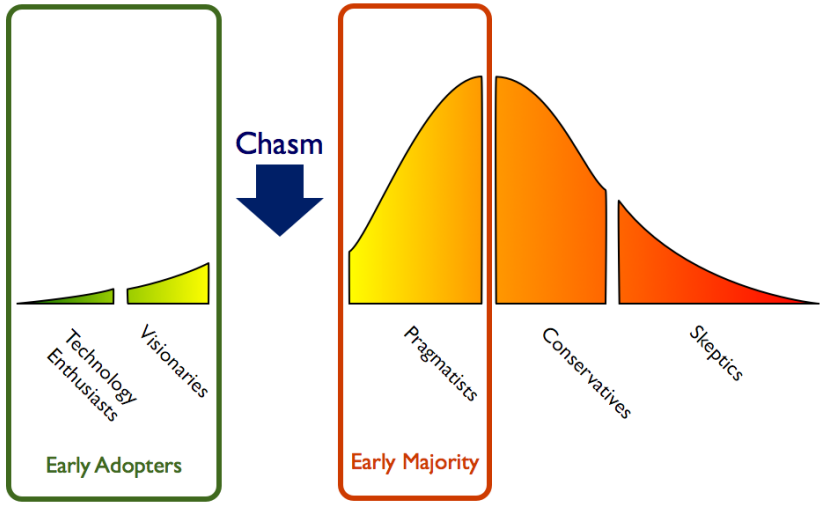
*** Excl. emerging markets*

Technology Impact

Big changes in technology always:

- Take longer than expected
- Have larger than anticipated impact





How to Invest – Private Markets

#	Name	Market Cap	Price
1	Bitcoin(/currencies/bitcoin/)	$75,722,284,676	$4575.70(/currencies/bitcoin/#markets)
2	Ethereum(/currencies/ethereum/)	$31,299,856,087	$331.32(/currencies/ethereum/#markets)
3	Bitcoin Cash(/currencies/bitcoin-cash/)	$10,582,541,126	$638.90(/currencies/bitcoin-cash/#markets)
4	Ripple(/currencies/ripple/)	$8,622,878,194	$0.224883(/currencies/ripple/#markets)
5	Litecoin(/currencies/litecoin/)	$4,213,097,574	$79.77(/currencies/litecoin/#markets)

How to invest – Public Markets

Consider when investing in companies who:

- Provide “trust”
  - Escrow
  - Custodian
  - Legal services
- Operate networks that moves assets
  - Exchanges
  - Payment networks
  - Cross-border remittance
  - Forex
  - International payments / trade finance

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My background

NFL
XLVIII
SEAHAWKS

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UNDERPERFORM: Expected to remain flat or lose value on a risk adjusted basis over next the 12-18 months

Rating Distribution (as of 6/30/2017)	Coverage Universe Distribution			Investment Banking Distribution		
	IR	IIG	Combined	IR	IIG	Combined
BUY (Buy)	56%	78%	58%	13%	0%	11%
NEUTRAL (Hold)	43%	19%	40%	6%	0%	5%
UNDERPERFORM (Sell)	1%	3%	2%	0%	0%	0%

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